

The **Iron Age**

A Chilton Publication

Are we heading
for steel scrap
trouble?
See page 71

THE NATIONAL METALWORKING WEEKLY • NOVEMBER 17, 1955



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Today, from supersonic military jets to fast-developing executive jet aircraft, New Departure ball bearings play a vital role in keeping moving parts functioning smoothly.

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 Philadelphia 39, Pa.

NEWS DEVELOPMENTS

IS STEEL HEADED TOWARD A SCRAP CRISIS? — P. 71
 Prices of steelmaking scrap threaten to get out of control. Mills are making every effort to keep a rein on the market. Emphasis on blast furnace production, home and industrial scrap help. Exports are controversial, but not much chance of controls because of international situation. Scrap industry believes it is caught in pinch, needs export market to keep going. Relative price levels of scrap to steel are controversial. Exports set record.

NO FAST TAX WRITEOFFS FOR STEEL BOOSTS—P. 75
 Secretary of Treasury Humphrey is adamant in his stand against further 5-year tax amortization for expansion of steel capacity. Nevertheless, expansion will go forward. The industry faces a gigantic job of providing, and paying for, new facilities to meet the needs of an expanding economy. Steel prices are important.

GET READY RIGHT NOW FOR JACK FROST — P. 76
 Snow, ice and cold weather which hit every year about this time can cost you money unless you are ready. No matter how small your organization, you can afford snow clearing equipment. Or you can have it done by road building contractors, most of whom are available during their off season. Watch ice in your pipes and low fuel supply. Both are costly.

BALANCED BUDGET COMES BEFORE TAX CUTS—P. 85
 Income taxes will probably be sliced next year. Congressional sentiment on both sides of the aisle is strongly in favor of tax relief. But Treasury Sec. Humphrey will resist new tax measures if they mean more deficit financing. Budget balance comes first.

DEFENSE ECONOMY WON'T REDUCE BUYING — P. 93
 Defense Dept. hopes to save \$500 million by July 30. But no cutbacks in defense contracts are planned. Savings will be made by reducing recreation frills at military posts, chopping payrolls and eliminating some secondary research programs.

PRODUCTION TOOL STOCKPILE APPEARS DEAD—P. 99
 Government has stopped buying long lead-time machines. Announcement said the program is under review and may be revived. Unspent funds are available but a resumption of buying isn't likely. Military services feel special purpose equipment bought now will be outmoded in two years.

IN METALWORKING

ENGINEERING & PRODUCTION

COLD FORMING CUTS PRODUCTION COSTS—P. 111

It usually takes less metal to cold extrude or coin quality parts than other production methods require. Added benefits often include fewer operations, higher strength, better finish, faster production rates. Expanding use of cold forming techniques is credited to better die design know-how, more efficient die lubrication methods. Here's how one small shop cut costs.

RAPID WELDING SPEEDS GIRDER FABRICATION—P. 116

A combination of welding techniques makes fast work of building up heavy steel plate bridge girders. Semi-automatic submerged arc welding is supplemented by manual methods using iron powder type electrodes. Speed of semiautomatic welding with wire feed averages 13-14 ipm.

CHEMICAL MILLING STRENGTHENS STRUCTURES—P. 118

Modern supersonic, sandwich-structure airframe designs require exceptionally close fit between core and facing for proper bonding. A new method for chemically milling skin sections permits close control, finer tolerances, and at a fraction of the former cost. The technique is finding wider use in aircraft and allied industries.

PRECIOUS METAL PLATING USES EXPAND—P. 120

Precious metal plating, once considered too expensive for industrial use, is rapidly finding its way as a low-cost method of achieving optimum serviceability. As a group, the precious metals offer high resistance to surface changes. Thin deposits of rhodium, for example, resist wear while retaining surface properties.

SINTERED PARTS GROUND FAST, ACCURATELY—P. 124

Grinding of parts to precise tolerances can often be the bottleneck in a mass production line. Such was the case at RCA. With a special machine, parts are now ground to a 16-microinch finish in three seconds. Mating segments of a four-piece deflection yoke for color TV tubes are ground to a flatness within .000020 in.

MARKETS & PRICES

STEEL MILL CRANE BUSINESS SHOWS PICKUP — P. 74

Heavy crane builders are finally coming in for their share of steel industry expansion after a year of marking time. A leading midwest manufacturer reports business looks good well into '56, is doing some expansion of its own. Outlook for the industry: a healthy part of the latest steel industry expansion business will go directly to crane producers.

PRESSURE ON OIL COUNTRY GOODS MOUNTS—P. 77

Oil country goods are tight, will get tighter. The pipe pinch stems from stepped-up drilling activity and the outlook is for more of the same next year. Consumption of petroleum products figures to go up.

COLOR: FRONTIER IN ARCHITECTURAL METALS—P. 78

With the impetus provided by architects who have been requesting wider mediums in which to work, the use of color bearing metals on building exteriors has suddenly become a field with tremendous growth potential. Porcelain enamel, anodized aluminum and glazed stainless steel are the leaders in the field with porcelain enamel-on-steel currently holding the edge.

STEEL WIRE SALES KINKS ARE UNWINDING — P. 80

Snapback in wire rod shipments, on the upgrade since mid-year, will bounce over into early '56 at an even better pace. Sales peaks will be hit during 2nd quarter, will probably show a moderate falloff of around 15 pct during 4th quarter. In all, next year will at least equal this year's total shipments of 5.2 million tons, is expected to do at least 10 pct better.

STEEL CONVERSION DEALS ARE MUSHROOMING—P. 167

More and more steel consumers are getting into conversion in an effort to beat the shortage. It's a costly operation but necessary. Meanwhile, it looks as though the market will be tight deep into 1956. And if there's no strike next year, another new record looms.

NEXT WEEK:

NEW HOT TOPS SAVE METAL, MAKE SOUNDER INGOTS

A new moldable exothermic material for hot top lining produces a sounder ingot and reduces feed metal losses to a minimum. Metal savings frequently exceed 10 pct. The new material can be used as a lining for conventional clay or cast iron hot top molds. Or it can be fed as a sleeve directly into the ingot mold.

HOW STRONG IS AMERICA'S AIRCRAFT INDUSTRY?

Aircraft manufacture is big business. Next week's special report tells exactly how big. It gives sales and backorder figures, covering the impact on suppliers. It discusses prospects, giving the outlook for continued defense orders and for permanent commercial business. A big market gets full coverage.

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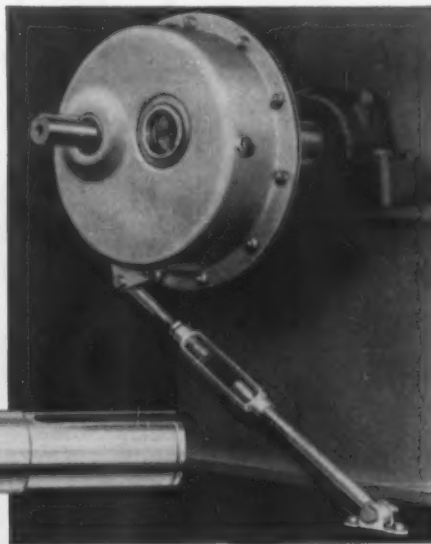
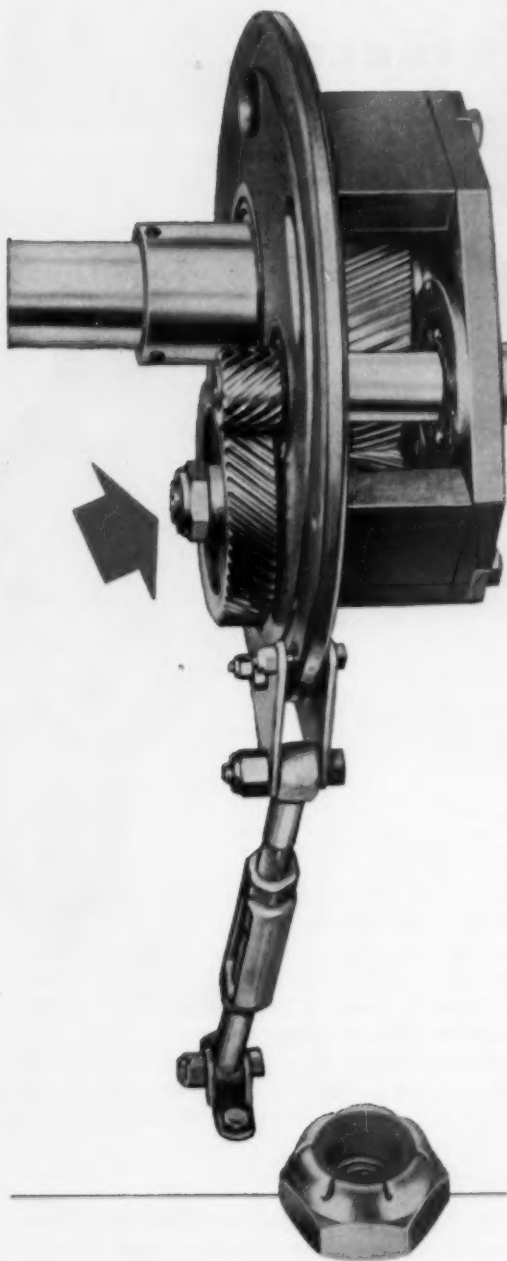
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The Falk Corp., of Milwaukee, also uses Elastic Stop nuts in the tie rod assembly... and on the gear housing to maintain tight cover fit.

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Indexed in the Industrial Arts Index
and the Engineering Index.



Editorial:

What's Ahead for 1956?

♦ IT IS A MITE too early for year-end forecasts. But we want to get ours in ahead of time. We won't use too many hedges or dodges; such as "barring a strike," "barring a war" or "barring the end of the world."

The official "inside" view is that business will falter a little in the second quarter. That is the time when a lot of businessmen are supposed to be dismayed that Ike won't run again. This dismay is supposed to take the form of lack of confidence. That in turn is supposed to adversely affect business.

We don't think it will turn out that way. Steel production will run close to capacity for the first six months of next year. Then comes the test of whether to stand up against a demand for a big wage increase and a supplemental unemployment benefit plan or give in to SUB in exchange for no wage increase, or a small one.

Even the people who'll be in the act don't know what they will do next June. But there is an even chance that there will be a steel strike. It all depends upon who the Republican candidate is. Whether or not there is a strike, the steel industry will eventually grant SUB in some form or other. That means higher prices.

The machine tool industry is slated for a big year in 1956. This is certain because increased wage costs for this year are not thoroughly offset—yet; and more are coming next year. Business is trying more and more to anticipate its needs for up-to-date equipment and machinery instead of being driven to it, perhaps too late.

The "inside" story that steel inventories will be topheavy by next July if there isn't a strike sounds too pat. Steel inventories will not be a problem until 1957—if then.

Aluminum production and expansion will roll merrily on in the coming year. It remains a growth industry which hasn't begun to realize its potential.

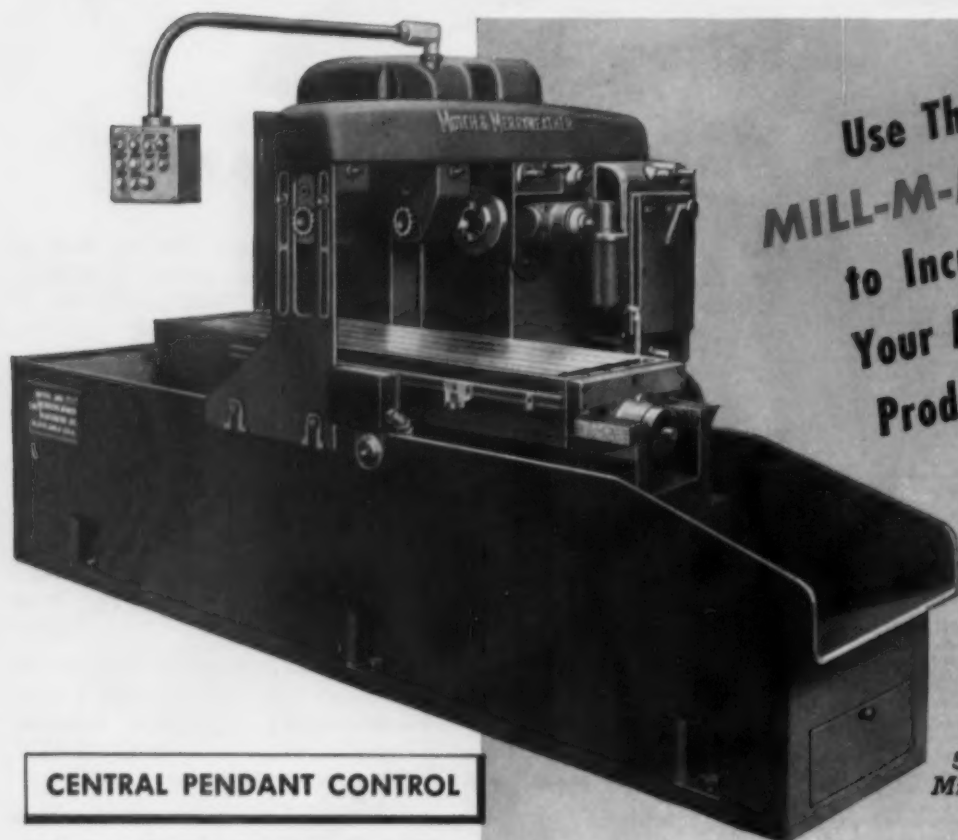
Extra dividends for 1956: More housing with no sharp dip expected; biggest freight car building program in years; a steel expansion program requiring 1 million tons of steel a year and a vast amount of machinery, equipment and raw materials; highway building; rediscovery of confidence.

Add to this: Indifference of the man-on-the-street to high-level pronouncements of doom.

Tom Campbell

EDITOR-IN-CHIEF

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Production!**

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MECHANICAL TABLE FEED

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dear editor:

letters from readers

Religion and Work

Sir:

I have just received a copy of the editorial comment given in your pages to the Church and Work Congress in Albany, October 19, 20 and 21. The article was written with real sympathy and understanding and we appreciate so much the fact that your periodical would take notice of the conference and the objectives which the Congress sought to accomplish.

It was indeed a very great pleasure to have Tom Campbell with us for the duration of the Congress; he is a most interesting, helpful and stimulating person. *The Rt. Rev. D. E. Richards, Suffragan Bishop of Albany.*

Sir:

I have read with much interest your article "Religion: God and Work Go Together" in the October 27th issue. I shall appreciate very much knowing when and where I may purchase the book outlining the proceedings of the Congress at Albany. *John R. Allison, Woodland Farms Road, R. D. 2, Pittsburgh.*

The proceedings will be published in book form about January 15, 1956. You may secure a copy for \$3.00 by writing: Albany Diocesan Bookstore, 68 South Swan St., Albany 10, N. Y.—Ed.

More Digests?

Sir:

Congratulations on a very fine magazine. Having a large variety of industrial magazines distributed to my desk as they pass through our department, I find yours the most profitable use of my time for reading.

This is due mainly to: (1) No time wasted finding articles of most interest due to your two pages of article "digest." (2) A wide variety of topics useful to a

person connected with any phase of engineering. (3) A wide variety of viewpoints, i. e., labor, government, management, material buyers (example September 1, 1955, page 51), builders, etc.

My only suggestion might be further capitalization on your method of digesting which I believe is the factor making your magazine superior to competitive magazines. Possibly you could have another digest column describing articles of secondary interest. This would prevent time-pressed readers from missing some articles which, in their own minds, might be of primary interest. *Richard N. Sussex, Lansing, Mich.*

Nothing Is Free

Sir:

I seriously object to your having misquoted my letter of October 20th in your "letters from readers"—issue of November 3rd—making it appear that I objected to the thought that "Adult Study Pays" (which was not in my letter). *Harry M. Hays, Asst. to Manager, Pullman-Standard Car Mfg. Co., Butler, Pa.*

Reader Hays quoted the title "Adult Education for Next to Nothing" from the digest on page 2. Believing that readers might not recognize the article from this description we switched the title given in Mr. Hays' letter to that which appeared on the article itself.

We regret any misunderstanding this may have caused and agree wholeheartedly that nothing is free just because it comes from the "Government." We pay for it in taxes.—Ed.

More Steel for Your \$

Sir:

Will you please forward promptly to my attention two additional copies of the article, "How to Get More for Your Steel Dollar." *D. E. Merriman, Purchasing Agent, The Stanley Works, New Britain, Conn.*

For Ideas Unlimited...



consider
a ball



Like everyone else who lives by "ideas," you, too, may now and then find yourself face-to-face with a blank drawing pad, wondering where your next idea is coming from...

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Why not put your special fastening needs in the most experienced hands? Call or write today and talk over your problem with the Continental engineers.



Continental Screw Co.

Manufacturers of Holtite Fastenings

NEW BEDFORD, MASSACHUSETTS, U. S. A.

fatigue cracks

New Front Cover

In case you missed it last month when we printed a full size sample, it is this department's pleasure to introduce you to the new type front cover which you'll see on your \$fj next year. (Pardon us while we change our dress.)



And just in case you think that all the editors have to do is look for pretty pictures for it, we beg to advise you to the contrary (*au contrary, fr.*) Reason we know is that we just passed the editorial conference room where a "Cover Meeting" was in process. These are not to be confused with story conferences, policy conferences or just plain conferences—which are really meetings. We don't have conferences. Too stuffy.

At any rate, and skipping the details, we can tell you that an enormous amount of time, effort and brainpower is going into planning a type of cover story which will give you even more for your reading time than ever before. Notice we speak of the "type" of cover story. The actual stories can't be planned this far ahead; most of them, being news type stories, must be worked right up to the deadline. Idea here is to keep them fresh, newswy.

by William M. Coffey

Book Review Dept.

Your government is still on the job. Just because we've been lax in reviewing the latest books published by y.g. doesn't mean they haven't been printing them. Here are a few new titles that should be in everybody's library.

The 5th Plate—if you think this is about chinaware, you're crazy. This is a story about land, people and food. Hints on the best places to eat. Stay away from South St., Monrovia.

What About Women Workers?—A few facts. Presents the answers to eight questions about women workers. Won't spoil this one for you so won't give the questions here. But they're real good. Some things in here you really didn't know about women workers. Pictures.

The Structure, Composition, and Growth of Bone, 1930-1953—a fairly comprehensive bibliography on bone, covering the period 1930 through 1953 with scattered references to 1954.

Wedding Plans—going to be wedded? Presents eight answers to eight questions about wedding plans. Won't spoil this one for you so won't give the questions here. But they're real good. No pictures.

Equal Pay for Women—y.g. seems to be much troubled about women. We are pleased. This does not rate two stars, however. Certainly not on a par with *The Structure, Composition, and Growth of Bone, 1930-1953*, with scattered references to 1954.

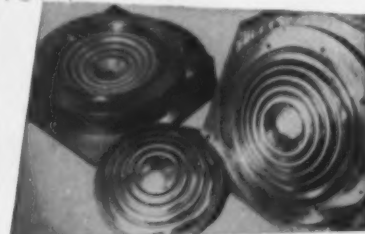
New Puzzler

"A mule and a donkey were walking along, laden with corn. The mule said to the donkey, "If you gave me one measure, I should carry twice as much as you. If I gave you one, we should both carry equal burdens." What were the burdens?

Now YOU CAN GET MORE TOOLING FOR YOUR DOLLAR



WHATEVER product you manufacture, Rezolin Toolplastik will aid you in reducing your production costs by providing you with a simple and effective method of tooling. Rezolin Toolplastik materials will reduce tool fabrication time and the cost of your present tooling material. Ideally suited for producing draw dies, drop hammer dies, stretch dies, chucks, assembly fixtures and jigs, models, etc.



INTERCHANGEABLE PLASTIC DRAW DIES
Produced and trimmed over 15,000 auto hub caps saving 40% of former tool costs.
Courtesy of Shors Metal Products, Los Angeles

Rezolin Toolplastik material offers more cubic inches of precision tooling per dollar than any other material in the field.

When a tooling need arises consider Toolplastik.

Write for your free informative Brochure and Handy Use Guide.

**REZOLIN
TOOLPLASTIK**

5736 WEST 96TH STREET
LOS ANGELES 45, CALIFORNIA

DALLAS • DETROIT • NEW YORK

EPOXY RESINS • PHENOLICS • DYTORM
ACCESSORY PRODUCTS

5th in a Series

OF HIGH PRODUCTION CASE HISTORIES

Baird Automatic Chucker again hits **PEAK PRODUCTION**

ASK



BAIRD

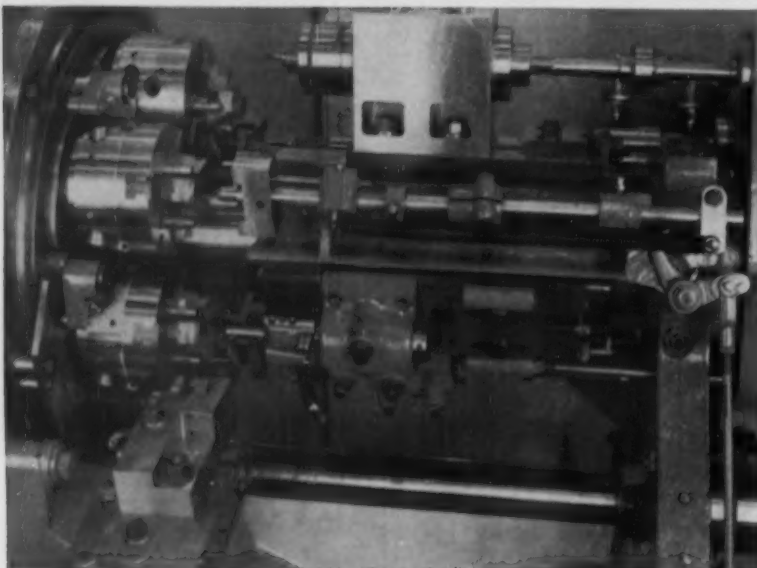
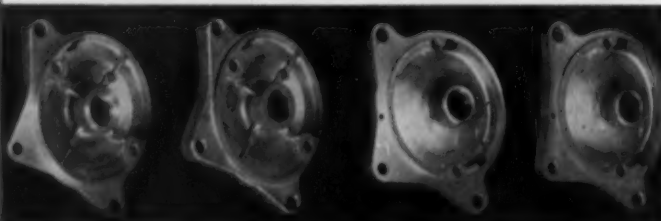
ABOUT IT

PART: Rear End Plate of Shoring Motor

MATERIAL: Die-Cast Aluminum

PRODUCTION:

420 PIECES PER HOUR



OPERATIONS

Back face and chamfer one end of hub, using a recessing tool. Bore center hole concentric with flange diameters with high speed boring head. Face both sides of flange and turn the diameters concentric with hole. Bore a small hole off center with high speed boring head and tap two holes. The work is located in proper position and held stationary while the off-center hole is bored and the two holes tapped.

TOOLING...

The Baird Automatic 76H Chucking Machine is arranged for single indexing and with a recessing tool for back facing . . . high speed boring heads . . . two-spindle lead screw tapping attachment. A typical example of the endlessly varied and basically simple arrangements possible with this versatile unit.

Write Dept. IA.

THE BAIRD MACHINE COMPANY
STRATFORD CONNECTICUT

WHERE YOU WILL GET THE HELP OF SPECIALISTS
ON THESE ESSENTIAL PRODUCTION PROBLEMS:

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL
FORMING MACHINES • AUTOMATIC PRESS • TURNING BARRELS

00459

dates to remember

NOVEMBER

THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS — Annual meeting, Nov. 27-30, Statler Hotel, Detroit, Mich. Society headquarters, 25 W. 45th St., New York.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION — Annual convention, Nov. 28-Dec. 1, Boca Raton, Fla. Institute headquarters, 101 Park Ave., New York.

EXPOSITIONS

1955

25TH EXPOSITION OF CHEMICAL INDUSTRIES—Dec. 5-9, Commercial Museum & Convention Hall, Philadelphia. Society headquarters, 480 Lexington Ave., New York.

1956

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

DECEMBER

SOCIETY FOR APPLIED SPECTROSCOPY—Regular meeting, Dec. 6, Hotel New Yorker, New York City. Society headquarters, Johns-Manville Research Center, Manville, N. J.

AIME—13th annual electric furnace conference, Dec. 7-9, William Penn Hotel, Pittsburgh. Society headquarters, 29 West 39th St., New York.

THE MATERIAL HANDLING INSTITUTE—Annual meeting, Dec. 12 & 13, Statler Hotel, New York City. Society headquarters, 813 Clark Bldg., Pittsburgh.

JANUARY

INSTITUTE OF SCRAP IRON & STEEL, INC.—Annual convention, Jan. 3-6, Hotel Sherman, Chicago. Society headquarters, 1729 H. St., N.W., Washington, D. C.

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Annual meeting, Jan. 9-13, The Sheraton-Cadillac Hotel and Hotel Statler, Detroit. Society headquarters, 29 W. 39th St., New York.

STEEL SHIPPING CONTAINER INSTITUTE, INC.—Winter meeting, Jan. 18-19, Hampshire House, New York City. Society headquarters, 600 Fifth Ave., New York City.

COMPRESSED GAS ASSN., INC.—Annual meeting, Jan. 23-24, The Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

TRUCK-TRAILER MANUFACTURERS ASSN.—15th annual convention, Jan. 23-25, Edgewater Gulf Hotel, Miss. Assn. headquarters, 1042 National Press Bldg., Washington, D. C.

PLANT MAINTENANCE & ENGINEERING SHOW—7th annual conference, Jan. 23-26, Convention Hall, Philadelphia. Society headquarters, Clapp & Pollock, Inc., 341 Madison Ave., New York.

Believe it or not!



a Machine Tool Weldment

Bases like this, Fabricated by Acme

excel in Strength, Rigidity, and Precision

Finish . . . save Weight and Cut Costs.

No Design is too complicated

. . . not even Yours!

In Doubt? Ask for Bulletin B-3
"The Facts about Weldments and Castings"

ACME WELDING

DIVISION OF THE UNITED TOOL & DIE CO.

1044 NEW BRITAIN AVE., W. HARTFORD, CONN.

STEEL
STAINLESS STEEL
EVERDUR
ALLOYS

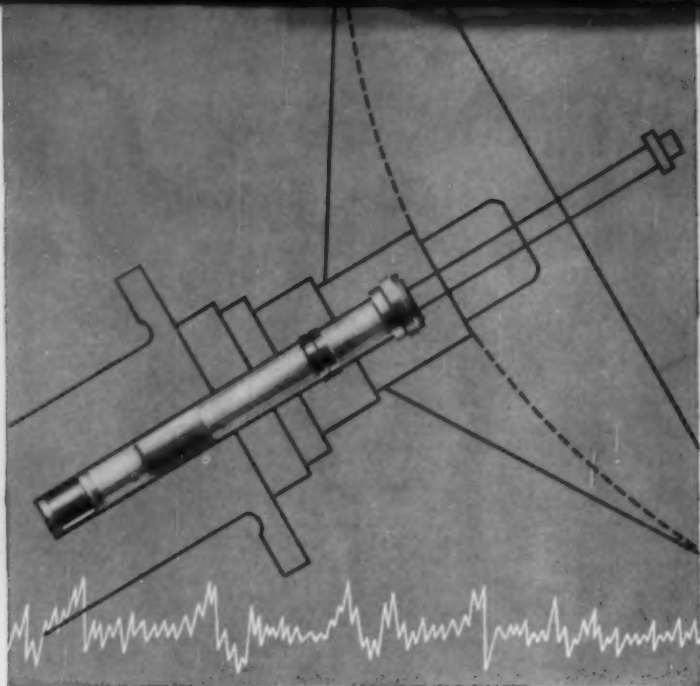
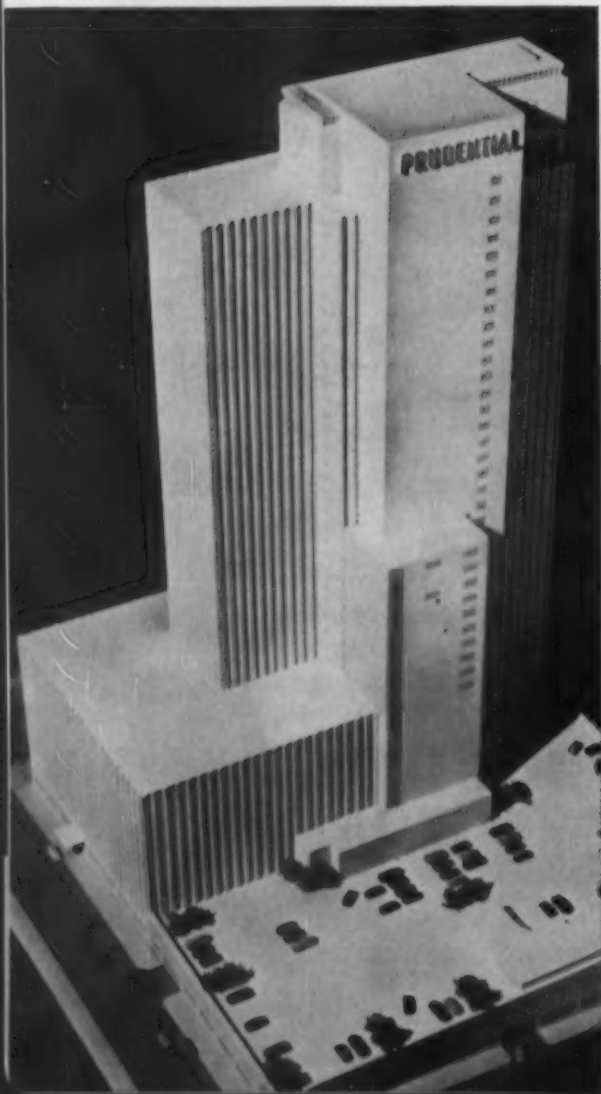
A.S.M.E. U68-U69 Qualified Welders • A.P.I. - A.S.M.E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service





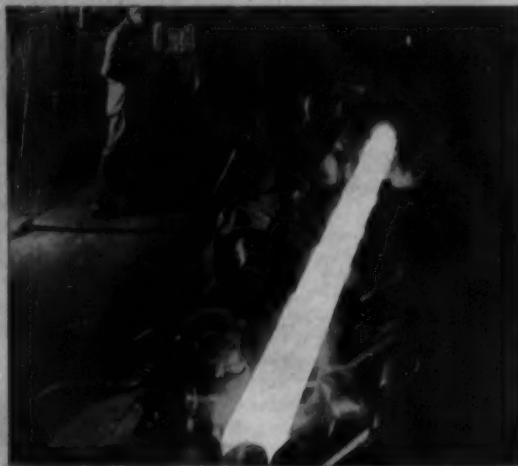
THE MACHINE GUNS OF the F2H-3 McDonnell Jet Interceptor pack a wallop. Mounted over the gun muzzles are Stainless Steel gun blast tubes of USS National Seamless, which restrain high pressures caused by firing the gun and also prevent the backflow of dangerous muzzle gases into the plane itself.

PRUDENTIAL INSURANCE COMPANY'S new Chicago office building employed in its construction more than 162 tons of National Seamless Pipe, diameters ranging from 2 to 20 inches, for heating and air conditioning. No other pipe offers safer and more efficient service.

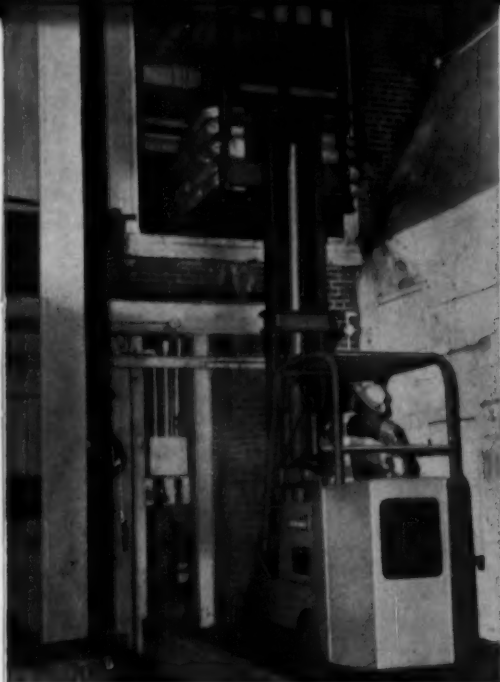


THE WAVE GUIDE TUBE of this radar scanner designed by Davis Industries, Detroit, Michigan, is manufactured from National Seamless Tubes of USS Stainless Steel. It will not corrode, needs no plating, and meets perfectly the required weight and strength factors.

BACKBONE OF A NATIONAL



THE NATIONAL SEAMLESS METHOD of manufacture is one of the most difficult forging operations in the steel industry. A billet of the finest steel is actually pierced to produce a seamless tube with absolutely uniform wall strength. No welds . . . no joints . . . no weaknesses.



THE TOWMOTOR LIFT TRUCK features a standard mast with one of the highest free lifts in the industry—25½ inches. Key to this powerful action is the hydraulic hoist cylinder of rugged, shock-absorbent National Seamless Mechanical Tubing—the “muscle” that puts the lift into every load hoisted.



THE WORLD'S DEEPEST AND LONGEST Submarine Pipeline Crossing was at the Straits of Mackinac—four miles wide and 250-feet deep. National Seamless Pipe, 20 inches in diameter, was welded into 2,500-foot-long sections for the big pull.

HUNDRED INDUSTRIES...

Seamless Pipe and Tubes

In every type of application—from the intricate heating and air conditioning system of a new skyscraper to the chattering, blazing machine guns of a jet fighter—you'll find USS NATIONAL Seamless Pipe and Tubes.

NATIONAL Seamless combines to the highest degree the desirable qualities of strength, safety and workability. Uniform throughout and dimensionally accurate, NATIONAL Seamless Pipe and Tubes ma-

chine cleanly, weld readily, and promise smooth installation and long satisfactory service. National Seamless Tubes are available in a complete range of steel analyses, wall thicknesses and diameters, every foot produced to exacting standards by the world's largest manufacturer of tubular steel products.

Bring your pipe and tubing problems to National Tube. Regardless of the application, our engineers are interested in discussing the problem with you.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

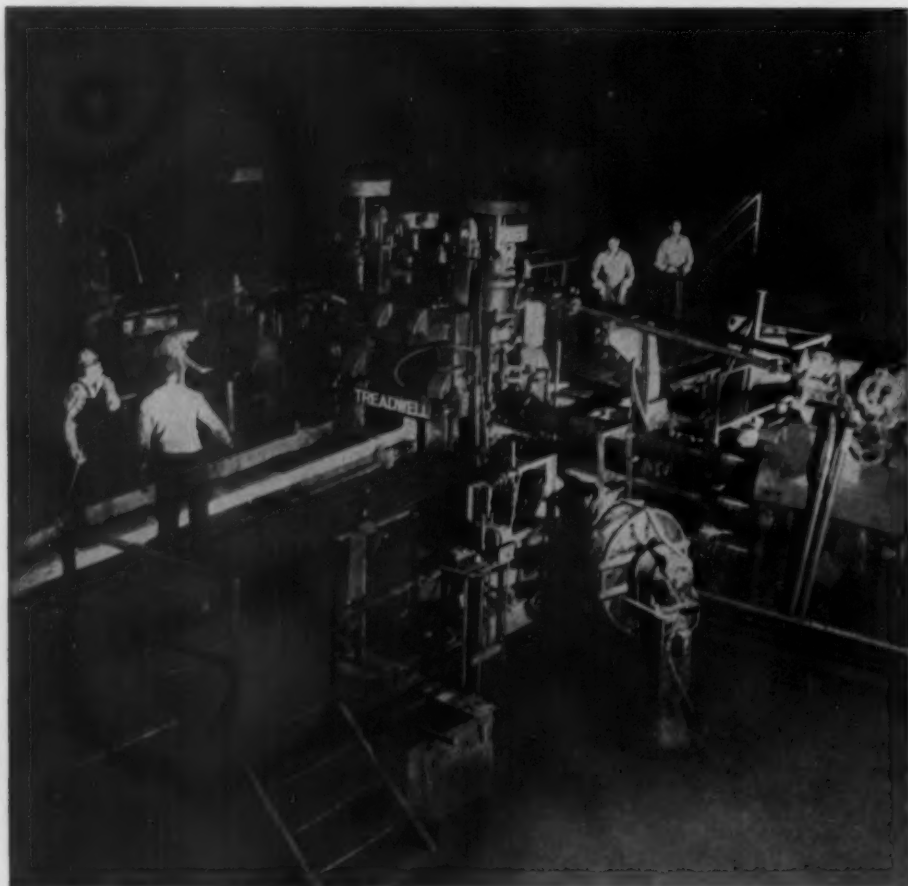


National Seamless Pipe and Tubes



UNITED STATES STEEL

Treadwell



Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters

Handling Equipment (Kick-
offs, Pliers, Cradles, etc.)

Steel and Iron Castings
Ni-Hard and Ductile Iron
Castings

Three-High Mill for rolling precision rounds and squares up to and including 5" round or square. The mill is equipped with motor operated screw-downs for both top and bottom rolls.



Treadwell Engineering Company

EASTON, PA.

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
Central 6-9784

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NEW YORK 6, N. Y.
Worth 4-3344

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
Atlantic 1-2883

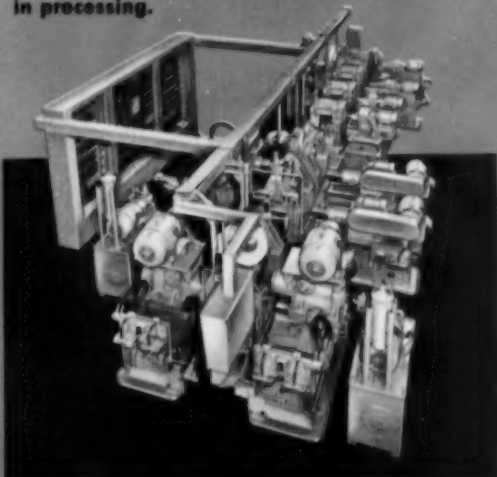
**SNYDER SEGMENTED
AUTOMATION** in 91 station,
182 operation, in-line transfer machine
features four segments which can
operate independently or as a unit to
assure continuous production of auto-
motive automatic transmission cases at
100 cases an hour at 80% efficiency

SNYDER

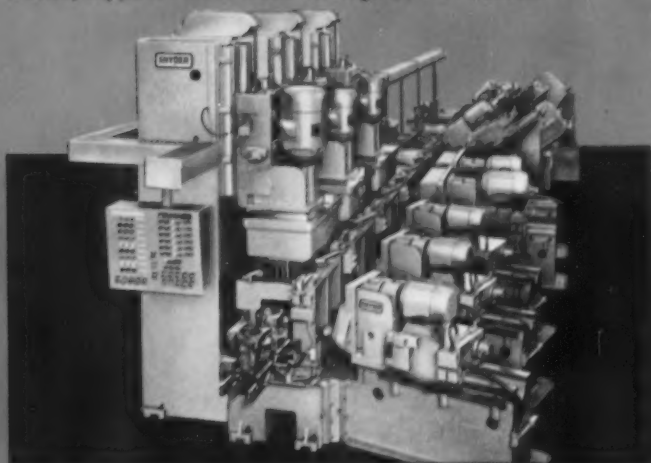
TOOL & ENGINEERING COMPANY
3400 E. LAFAYETTE, DETROIT 7, MICHIGAN

30 Years of Successful Cooperation with Leading American Industries

SEGMENT 1: 40 feet long, 19 stations, 10 spindles. Part manually loaded, both ends face milled, counterbored, three diameters rough and finish bored and faced, two pads side milled, pump pad face milled, clearance slot milled. Part tilted 90 degrees in processing.



SEGMENT 2: 47 feet long, 31 stations, 91 spindles. In top face, end and at angular locations inside, 51 holes are drilled, countersunk, semi-finish and finish reamed, spot-faced, tapped. Part is tilted 90 degrees and rotated.





SNYDER TOOL and ENGINEERING COMPANY



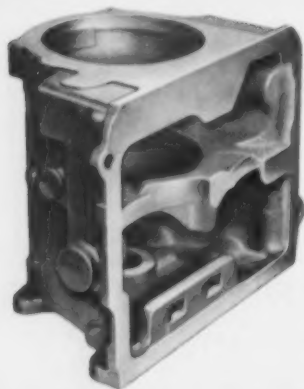


Y As a fitting climax to our thirtieth anniversary year, we are happy to announce plant expansions which will add about one third to our machine shop and assembly floor areas and which will enable us to add to our precision machining equipment and accommodate more

manpower. We are happy, too, to take this opportunity to thank all our friends who have made this modern plant possible—our customers, our suppliers and all of the hundreds of members of the Snyder family of workers, here and throughout the country.

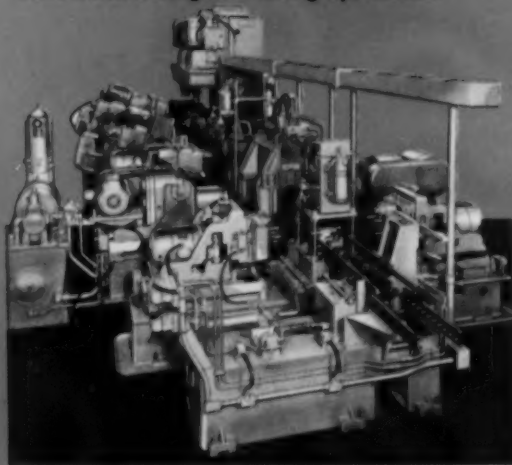
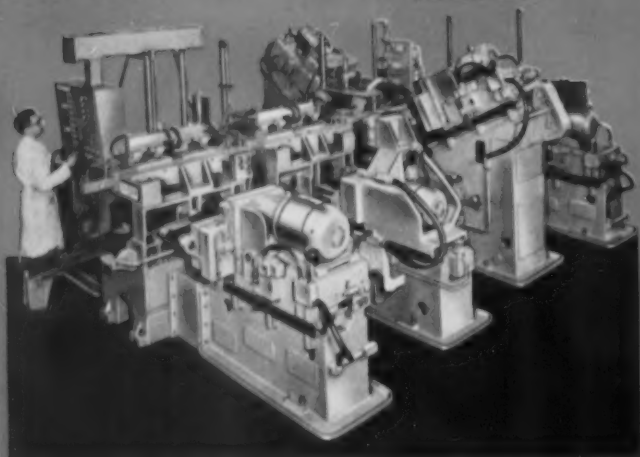


The complete pick-up tank is supplied with sample compartment, pump and hose. Stainless Steel is used for
 John F. Smith Products Company, St. Paul, Minn., is the manufacturer.



SEGMENT 3: 26 feet long, 17 stations, 21 spindles. Various drilling, chamfering, tapping, counterboring, reaming, spotting operations in both case sides. Part removed from transfer bar to special fixture and tipped 45 degrees to process angular inside hole, returned to transfer bar, turned 90 degrees, tilted 90 degrees to bring pump face up.

SEGMENT 4: 36 feet long, 24 stations, 60 spindles. Various drilling, chamfering, tapping, semi-finish boring and facing operations.



The complete pick-up tank is supplied with sample compartment, pump and hose. Stainless Steel is used for both interior and exterior surfaces. Stainless & Steel Products Company, St. Paul, Minn., is the manufacturer.



This tank truck had to be made from Stainless Steel



Tank shells are rolled on a 10' roll. Notice adhesive cloth tape used to protect inside surface of tank until job is complete.

The dairy and dairy equipment industries have been awfully busy these past few years, working out ways to reduce costs and maintain the flavor and quality of milk.

One major step has been *bulk milk* pickup. Instead of storing his milk in cans, today's modern farmer uses a Stainless Steel storage tank. Then, every-other-day, the dairy sends a tank truck to pick up the milk. The tank on the truck has to be made from Stainless Steel, because no other metal has such a unique combination of strength, corrosion resistance and cleanability.

The manufacturer of this tank truck uses Types 302 and 304 Stainless Steel—14-gauge shells for tanks 2000 gallons and under, 12-gauge for tanks 2000 to 5000 gallons. Both

gauges are sheared, rolled and punched on equipment with a nominal capacity of $\frac{3}{4}$ " carbon steel. Holes are cut with a carbon-arc torch, and all fittings are attached with electric arc welding.

If you have been wondering whether you can handle Stainless Steel successfully in your own shop with your present equipment, just remember that fabrication of Stainless Steel isn't difficult — it's just different.

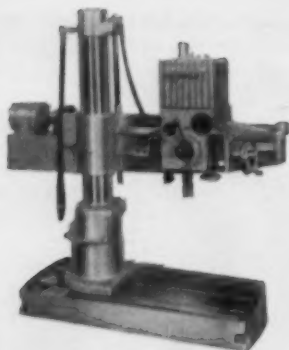
UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
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USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

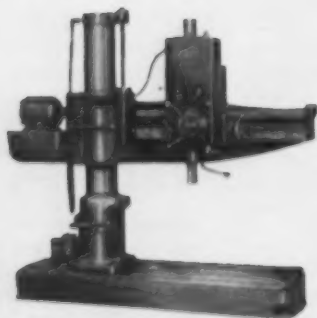


UNITED STATES STEEL



FIRST WITH HARDENED COLUMNS

for 9" and 11" radials



Now, for the first time, you can gain the advantages of hardened columns on radial drilling machines with 9" and 11" columns. Because they resist scoring and hold dimensional accuracy under most extreme conditions, these new columns may well add years of service to our machines.

We offer them to industry only after several years of experimenting and testing have proved our procedure. After we turn the cast columns, we flame-harden them to Rockwell C 52-56, at a depth of $\frac{1}{16}$ " to $\frac{3}{32}$ ". Then we finish grind them to close tolerances in straightness, roundness, and surface finish.

It will be worth your time to write us today.
The Cincinnati Gilbert Machine Tool Co.
3366 Beekman St., Cincinnati 23, Ohio

A 3' arm 9" column radial can be purchased for as little as \$1100 down and \$80.67 a month for five years. Includes 6% simple interest (or about 3% add-on).

those who buy Gilbert buy **GILBERT** *again*

STRONGER, SAFER, STREAMLINED CONSTRUCTION



"ASSEMBLY IMPROVED IMMEDIATELY when we began using Phillips screws," relates the assistant purchasing agent of Fasco Industries, Rochester, N. Y., leading makers of shaded pole motors, blowers, fans and ventilators. "Now we can use mechanical drivers that save plenty of time. Burring seldom happens any more. Product appearance couldn't be better. Whether inside for extra sturdiness, or outside for extra dressiness, we use Phillips screws almost exclusively!"



MORALE AND PRODUCTION SOARED with changeover to Phillips screws, which now comprise more than 92% of all screws used at Yankee Metal Products Corporation, Norwalk, Conn. Makers of auto lamps, mirrors and safety equipment since 1915, Yankee depends on many types of Phillips heads — both unplated and chromed to match accessories. Yankee's Merchandising Director says happily, "Phillips screws for extra safety, speed and ease of use really build plant morale and incentive earnings!"

... with Phillips Cross-Recessed-Head Screws



EXTREME ANGLES NO PROBLEM where tightness is vital as in this fan assembly built by leading small motors manufacturer A. C. Gilbert of New Haven, Conn., to withstand lifelong vibration. Single-slot screws proved treacherous and expensive in time and damage loss. An executive engineer for Gilbert says, "Using Phillips screws for over 10 years, we have learned that, for all around production efficiency, Phillips are the best."



Allmetal Screw Products Company, Inc. • American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Company • The Eagle Lock Company • Elco Tool and Screw Corporation • Great Lakes Screw Corporation • The H. M. Harper Co. • The Lamson & Sessions Company • National Lock Company • The National Screw & Manufacturing Co. • Parker-Kalon Div. General American Transportation Corporation • Pheoli Manufacturing Company • Rockford Screw Products Company • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hardware Manufacturing Company • Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation



DISSTON **STAINLESS** **STEEL**

**...hot rolled
to SHAPE**



saves steel • tooling • machining

Stainless steel users receive many advantages by ordering Disston steel shapes accurately rolled to their specifications.

LESS MACHINING. Tool operations are simplified, for Disston shapes are rolled to precision tolerances, have exceptionally fine finishes.

REDUCTION IN WASTE MATERIAL. Preshaped Disston steel reduces scrap losses. One well-known manufacturer saved 47% of stainless steel tonnage by starting with a rolled Disston shape—instead of a rectangular section.

LOW-COST HANDLING OF SMALL ORDERS. Jobs as little as five or ten tons on a particular shape are rolled easily, economically in the Disston mills. Over 100 years of leadership in the rolling of special shapes gives Disston the edge in metal-shaping skill and technique.

Why not talk over your requirements with a Disston representative? Learn how much you can save by using Disston stainless steel shapes. Or write to:

Henry Disston & Sons, Inc., Steel Sales Division
1119 Tacony, Philadelphia 35, Pa., U.S.A.

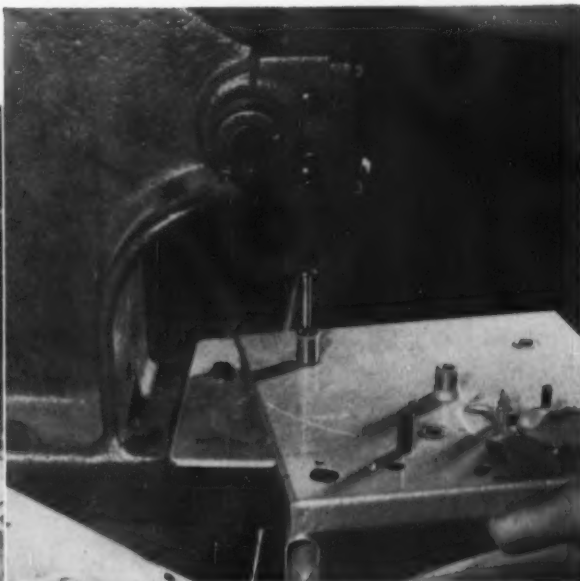
DISSTON HAS THE EDGE®

in special purpose steels
and special steel shapes.





Johnson Ledaloyl self-lubricating bearings hold oil like a sponge—will never need oiling for the life of Telectro tape recorders. Here one is being slipped on to the shaft of component.



Accuracy of Ledaloyl bearings makes for snug press-fit in the base plate of Telectro recorder.

For Accuracy, Durability And Economy, Telectro Industries Uses Johnson Ledaloyl Self-Lubricating Bearings

Telectro Industries Corporation of Long Island City, New York, insists that every component of their wire and tape recorders must have the quality and stamina to give trouble-free service for the life of the machine.

That is why they chose Johnson Ledaloyl bearings according to Mr. Roy Yasen, Purchasing Agent, who says: "Everything considered—accuracy, price and delivery—we find these self-lubricating bearings to be the most durable in this price range." "People who buy these recorders won't be bothered with taking them apart to oil bearings," continues Mr. Yasen, "that's why



A handful of trouble-free service for Telectro—Johnson Ledaloyl bearings assure durability of recorder, yet are economical and easy to install.

we use Johnson Ledaloyl bearings, that have the oil right in them. They last as long as the machines, without lubrication."

A Johnson distributor services Telectro, gives them immediate delivery on stock sizes, calls in a Johnson field engineer to help work out any special items.

Your local Johnson distributor has available more than 400 stock sizes in three basic types—he will be glad to work with you in developing new economy and performance in the items you manufacture. Johnson Bronze Company, 505 South Mill Street, New Castle, Pennsylvania.

Johnson Bearings



GRAPHITED
over 175 sizes



GENERAL PURPOSE
over 900 sizes



UNIVERSAL BRONZE BARS
over 400 sizes



LEDALOYL
over 400 sizes



ELECTRIC MOTOR
over 350 sizes



THE 30-FOOT HEARTH IS HERE!



World's largest blast furnace built for Great Lakes Steel

The 30-foot blast furnace has been a more elusive goal to steelmakers than the 4-minute mile to runners and the sound barrier to fliers.

Back in 1918, the steel industry hailed the construction of the first furnace with a 20-foot hearth . . . and set its sights higher. Now, 37 years later, the 30-foot hearth is here.

Proud possessor of the world's largest blast furnace is the Great Lakes Steel Corporation of Detroit, Michigan—a division of National Steel Corporation. Proud designer and erector of this new giant is the Freyn Department of Koppers Engineering and Construction Division.

Great Lakes Steel's new Blast Furnace "A" has a hearth diameter of 30 feet, 3

inches, and a total interior volume of 64,435 cubic feet. This new furnace soars 260 feet above the yard level. Total weight of this mammoth iron-maker, when fully charged, is about 12,800 tons.

Blast Furnace "A" was blown in last June. Engineers predict that, as operating experience develops, the furnace may average 60,000 net tons of iron per month . . . and break the world's record for production.

Designing and constructing blast furnaces is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

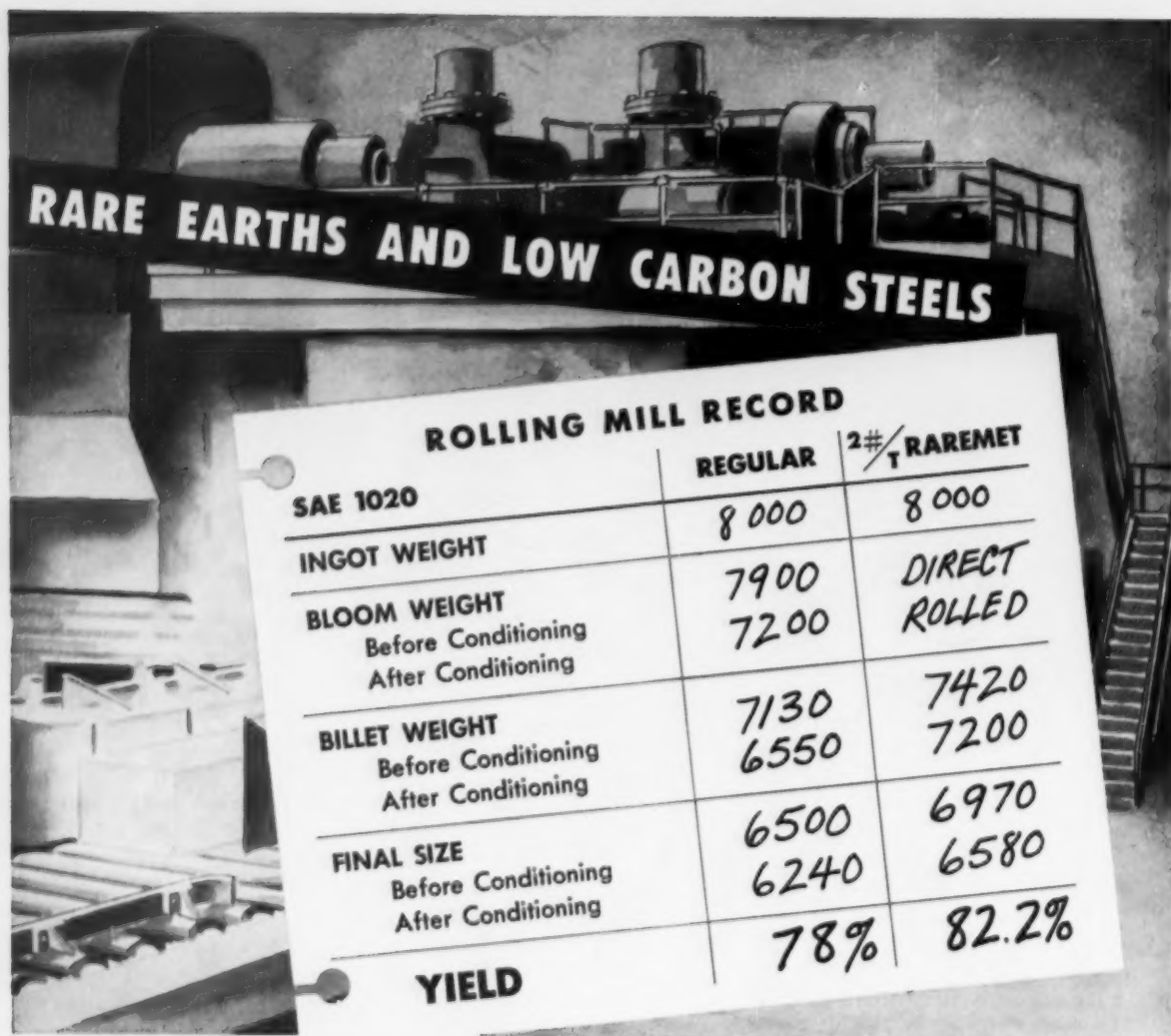


Engineering and Construction Division

FREYN DEPARTMENT

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

Great Lakes Steel's new blast furnace at Zug Island, River Rouge, Michigan. With a hearth diameter of 30 feet, 3 inches, this is the world's largest blast furnace. A realistic pig-iron production target is 60,000 tons monthly.



The troubles of producing low carbon steels have been mainly confined to rolling and surface preparation.

Since production economies are necessary, it's important to know what marked improvements have recently been obtained by Rare Earths in steel production. Minimizing blooming mill cracking, less conditioning time per ton, and increased yields are some of the results already proven. More than 200 production heats of low carbon steel show production savings

which alert steel operators can use to advantage.

This recent progress further justifies economical rare earth additions for iron and steel. Commercially known as RareMeT Compound, it is conveniently packaged in ten pound containers.

Operating the world's largest rare earth deposits, Molybdenum Corporation of America welcomes requests for additional technical application data for specific problems. Complete and immediate response to inquiries is offered.

MOLYBDENUM

CORPORATION OF AMERICA

Grant Building

Pittsburgh 19, Pa.

Offices: Pittsburgh, Chicago, Detroit, Los Angeles, New York, San Francisco
 Sales Representatives: Edgar L. Fink, Detroit; Brunley-Donaldson Co., Los Angeles, San Francisco
 Subsidiary: Cleveland Tungsten, Inc., Cleveland
 Plants: Washington, Pa., York, Pa.





"WE CUT PRODUCTION COSTS WITH THE SURFINDICATOR*!"

PRODUCING PRECISION PARTS is a requirement at Hydraulic Press Manufacturing Company, Mount Gilead, Ohio. Thus, the company uses the Brush SURFINDICATOR to check surface finish on pumps, presses, valves, and cylinder parts. A regular inspection tool, the SURFINDICATOR is used 20 to 50 times a day.

HPM reports, "dollar savings in production resulting from use of the SURFINDICATOR." Inspection is speedy, accurate, definite. The human factor in estimating surface finish is eliminated.

The SURFINDICATOR, priced from \$765, is an invaluable inspection tool for any plant that must produce parts to specified finishes. You can meet specifications exactly—eliminate costly over-finishing, end guesswork. Let a Brush representative demonstrate the SURFINDICATOR in your plant—no obligation.

*Trade-Mark

BRUSH ELECTRONICS

INDUSTRIAL AND RESEARCH INSTRUMENTS
PIEZOELECTRIC MATERIALS • ACOUSTIC DEVICES
MAGNETIC RECORDING EQUIPMENT AND COMPONENTS



COMPANY

Division of
Clevite Corporation

VARIETY OF SURFACE SPECIFICATIONS USED BY DIFFERENT COMPANIES								
	A	B	C	D	E	F	G	H
0					VVV			
2					VVV			
4	b				VVV			
8					VVV			
16		G6			VVV			
32	TM	G			VVV			
63	21-50	ff			VV			
125	91-50	f						
250								
500		RG						
1000								

MICRONS: 0, 2, 4, 8, 16, 32, 63, 125, 250, 500, 1000
 FINISHES: POLISH, SMOOTH, TOOL, ROUGH

**New Standard Eliminates Confusion
in Surface Specifications**

These individual methods of specifying surface finish can now be replaced by one uniform system with the new ASA and MIL-10 Standard. The Brush SURFINDICATOR is the only instrument completely meeting the new Standard.

Brush Electronics Company, Dept. 5-11
3405 Perkins Avenue, Cleveland 14, Ohio

- ☐ Please send booklet describing New ASA Standard B46.1, and illustrating SURFINDICATOR.
☐ Have your representative call.

Name _____

Position _____

Company _____

Address _____

City _____ State _____

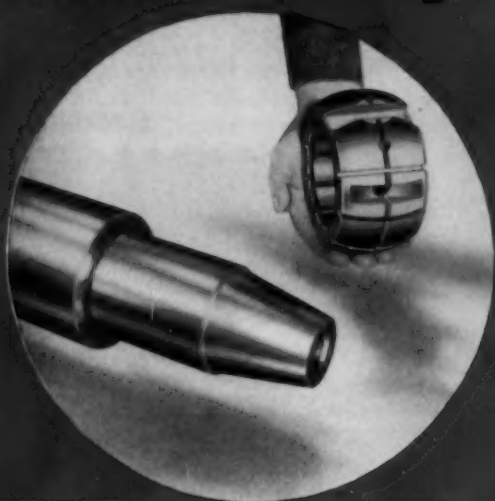
Features that reduce cost . .



Landis 10" x 36" Type CH Plain Grinder

LANDIS
precision grinders

increase operator output



FAST STOCK REMOVAL

"Rigidized" Microsphere bearings and spindles increase production by heavy cuts without loss of finish and accuracy. A Landis exclusive.



SETUP TIME REDUCED

Centralized controls speed setup to give more production time. Controls handy for operator save motion and reduce fatigue.

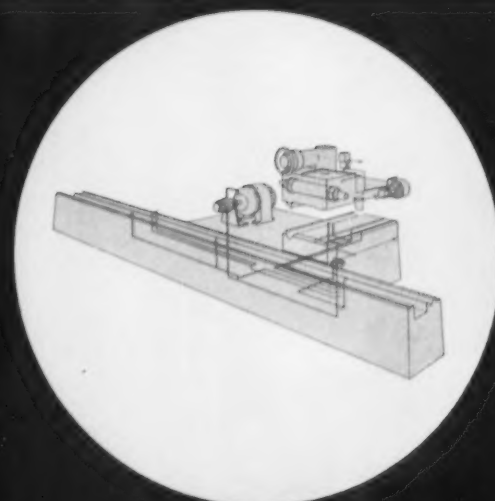
EYE LEVEL WHEEL FEED

The wheel feed is at eye-level—Easy for operator to watch grinding and wheel feed graduations without moving.



PROTECTED LUBRICATION

Automatic spindle and way lubrication for dependable operation and machine protection. This is a schematic diagram.



LANDIS TOOL COMPANY

WAYNESBORO, PENNA.

NOW AVAILABLE IN FIELD-ERECTED FURNACES

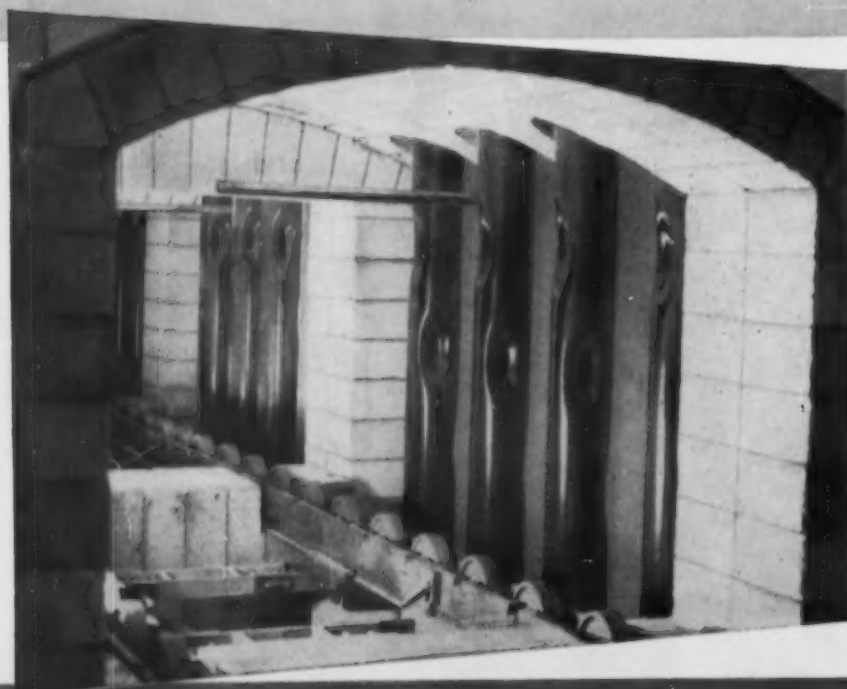


ELECTRIC



CORRTHERM elements are large corrugated sheets of nickel chromium and were developed in Lindberg laboratories by Lindberg metallurgists and engineers. At the left, installation of CORRTHERM elements in large rotary furnace currently being erected by Lindberg Industrial in plant of a leading automotive parts manufacturer.

FOR ELECTRIC FURNACES ... FOR GAS FURNACES



GAS



The famous Lindberg "dimple" vertical radiant tube, designed by Lindberg engineers has proved its superior efficiency in hundreds of furnace installations since 1953. The photograph at the left shows its installation in a large pusher-type furnace built for a leading automotive manufacturer.

Lindberg Industrial Corporation is ready to serve these industries: Aluminum, Automotive, Building Supplies, Copper & Brass, Ceramics & Glass, Plastics, Pulp & Wood Products, Steel and many others.

LINDBERG



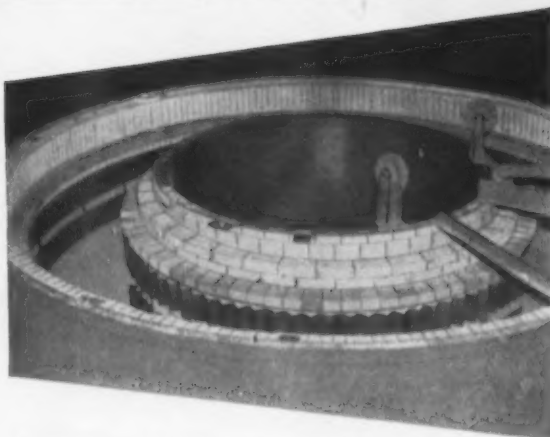
BY LINDBERG INDUSTRIAL!

Where source of heat is electricity!

CORRTHERM, Lindberg's radically advanced new electric heating element offers advantages never before available for heat treating furnaces. With this new element even carburizing and carbonitriding with electricity becomes practical, efficient and economical.

CORRTHERM elements operate at extremely low voltage. Consequently, leakage through carbon saturation and shock or short hazards are eliminated. Elements also act as baffles to direct circulation of convection streams.

CORRTHERM elements are practically indestructible. Work load or operator's charging tool can't hurt them. Watts density is at all time low. Easily installed or replaced, too, as element merely hangs in furnace and no complicated mountings are required.



A construction photo of one of two large rotary furnaces now being built by Lindberg Industrial for a leading automotive parts manufacturer. A section of this same furnace is shown on the opposite page.

THE MOST ADVANCED HEAT ELEMENTS YET DEVELOPED

Where gas is the source of heat.

Because of Lindberg's revolutionary design, this tube provides a new level of furnace performance. The secret lies in the new Lindberg tube's "dimples." The tube carries a central stream of mixed air-and-gas surrounded by a cylindrical stream of air alone. Combustion occurs in the area between these two streams. The "dimples" create eddies accelerating combustion and maintaining even temperatures along the entire tube.

This Lindberg tube will operate at maximum efficiency for a longer period of time. The special protective coating gives greatest possible resistance to carbon penetration. Vertical position eliminates soot deposit and resultant temperature increases at points of sooting.

Tubes are just 59 inches long and weigh only 29 pounds, changeable in a few minutes. No costly furnace shut-downs and no high labor and material cost for tube changes.



This three-row pusher-type carburizing furnace provides maximum heat uniformity through use of Lindberg vertical radiant tubes installed between each row as well as at side walls, providing accurate control of case depth and properties. This highly efficient furnace with Lindberg vertical radiant tubes carburizes 650 lbs. of gears per hour with an effective case of .055".

INDUSTRIAL CORPORATION

Specialists in Field-erected Equipment

CHICAGO PLANT: 2321 WEST HUBBARD STREET, CHICAGO, ILLINOIS
LOS ANGELES PLANT: 11937 REGENTVIEW AVE., AT DOWNEY, CAL.

Lindberg Industrial provides a complete consulting, designing and construction service including completed installation in your own plant. Call your nearest Lindberg Field Representative (see classified section of your telephone book) or write us direct.



Here's the new cost-cutting answer to conveying problems!

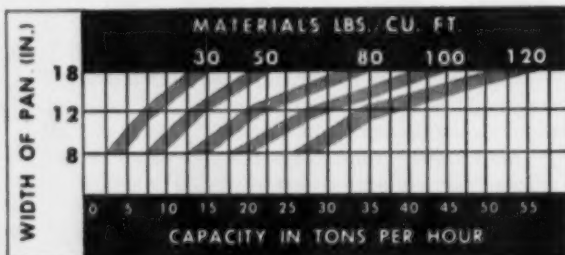
Immediate Delivery on Hewitt-Robins Springmount Vibrating Conveyor Systems to Handle Almost Any Material . . . For Unlimited Distances . . . With Minimum Power Requirements!

The new, low-cost Hewitt-Robins Springmount Vibrating Conveyor is the answer to your materials handling problems. Designed for efficiency in action, the balanced-vibration principle of this new conveyor unit results in low dynamic loads . . . units up to 100 feet run on just a one horsepower drive! Compared to other conveying mediums the new Hewitt-Robins Springmount Vibrating Conveyor provides not only low initial cost, but later savings in operation and maintenance!

These conveyors are job-proven to be rugged! Gentle, even hopping action up to 50' per minute, the standard 4" troughed pan will carry materials; sub-freezing to 500° F.—lump or fines—wet or dry—loose or packaged—dense or porous—malleable or brittle! Special pans are available for temperatures up to 1200° F. and for severely abrasive or corrosive materials.

Hewitt-Robins Springmount Conveyors are adaptable

. . . standard pan widths of 8", 12" and 18" are available in lengths from 10' and up, in standard easy-to-assemble prefabricated units . . . dividers, gates and intermediate discharge points allow flexible combinations on any conveyor operation . . . assured power-economy, in that one horsepower drives 100' of 8" pan, 80' of 12" pan or 60' of 18" pan!



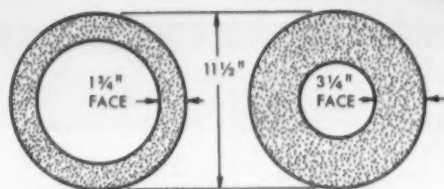
Get more detailed information on the versatile Springmount Vibrating Conveyor! Contact your nearest Hewitt-Robins agent or distributor . . . or write today to Dept. VC-1, Hewitt-Robins Inc., Stamford, Conn.



Conveyor Belting—Conveyor Machinery—Industrial Hose—Vibrating Screens—Vibrating Conveyors—Design, Manufacture, Engineering and Erection of Complete Bulk Materials Handling Systems.

HEWITT-ROBINS INCORPORATED • STAMFORD, CONNECTICUT

Production per wheel up 36%



FORMER WHEEL
47,405 PIECES

GARDNER WHEEL
65,050 PIECES

**use of wider face increases production—
cuts abrasive costs.**

There may be a similar opportunity in your shop to cut abrasive costs. A request gets an analysis of your job.

GARDNER

abrasive discs

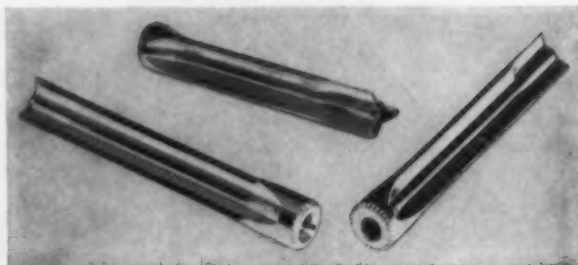
BELOIT, WISCONSIN

WIDE ENDURO BELT

...keeps scratches off bandages



CORROSION RESISTANCE IN TUBULAR FORM. Republic's Steel and Tubes Division turns out miles of ENDURO Stainless Steel Tubing for the process industries and for mechanical applications. Republic ELECTRUNITE Stainless Steel Tubing and Pipe offer the identical high mechanical and corrosion-resisting properties demonstrated in sheet form by the Reynolon belt. Call Steel and Tubes for application assistance on all your fluid handling and tubing problems.



WHAT'S EVEN MORE CORROSION-RESISTANT? REPUBLIC TITANIUM. Titanium surpasses even stainless steel in resistance to many severe forms of corrosion. Yet, it weighs only 56% as much as alloy steel. Here, Republic Titanium supplies corrosion-resistance and lighter weight to parts designed to knit human bones. Republic Titanium and Titanium alloys now are available for civilian applications. Republic has the experience to help you use them best. Write us.



REPUBLIC STEEL CORPORATION
3104 East 45th Street,
Cleveland 27, Ohio

I'm interested in additional information on:

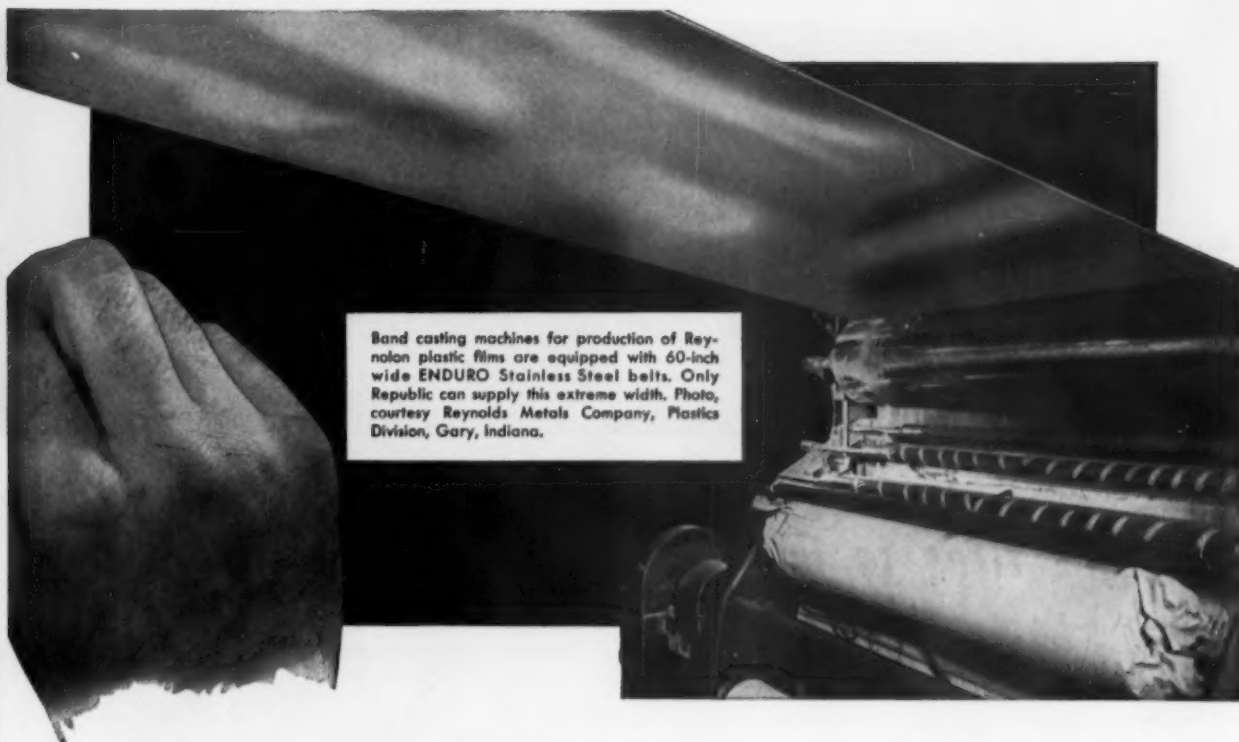
- | | |
|--|---|
| <input type="checkbox"/> Republic ENDURO® Stainless Steel | <input type="checkbox"/> Republic Steel Drums and Barrels |
| <input type="checkbox"/> Stainless Metallurgical Assistance | |
| <input type="checkbox"/> ELECTRUNITE® Stainless Steel Tubing | |
| <input type="checkbox"/> Republic Titanium | |

Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____

U.S. 501-A

NO CONTAMINATION—NO SPOILAGE. Republic Steel offers a full range of barrels, drums and pails in a variety of metals and finishes to protect your chemical, food and other products. Choose from ENDURO Stainless Steel, hot dipped galvanized steel, hot dipped tinneled steel, mill galvanized sheet steel, hot rolled open hearth steel, plain or lacquer lined. Choice of gages to meet all handling and shipping requirements. Many styles in sizes up to 55 gallons. Contact Republic.





Band casting machines for production of Reynolon plastic films are equipped with 60-inch wide ENDURO Stainless Steel belts. Only Republic can supply this extreme width. Photo, courtesy Reynolds Metals Company, Plastics Division, Gary, Indiana.

This wide, polished ENDURO Stainless Steel belt carries Reynolon plastic coatings in process. One such type makes the peel-off backing for those handy packaged small bandages you use.

The ENDURO surface provides a high luster finish! Since the slightest scratch would be "mirrored" or duplicated in the finished product, the quality of the stainless steel surface determines the quality of the plastic coating. Here, ENDURO keeps scratches off bandages!

Note that the belt is supported only by top rollers. That allows both sides to carry the plastic material . . . speeds production. It also means that the belt must have great tensile strength. ENDURO supplies that strength. In this case, tension on the belt runs as high as 90 tons.

What's more, this belt must be heat-resistant. In process, material passes through 600° ovens. And, many of the plastics processed are in hydrous or acidic solutions. So, the belt must resist rust and corrosion. ENDURO does just that.

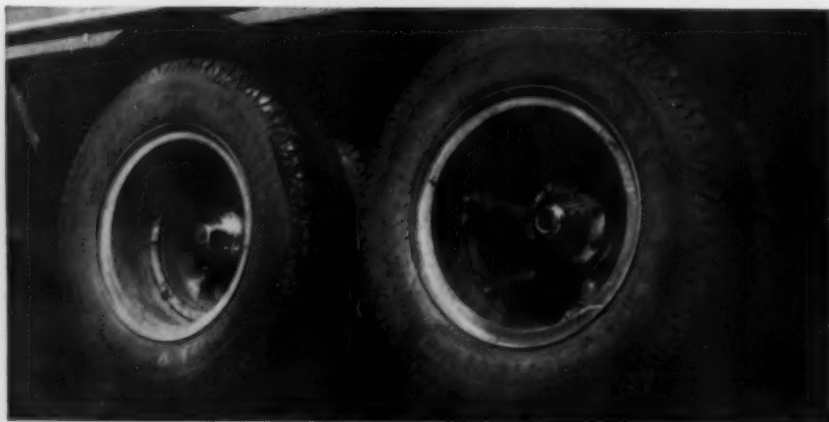
Four of these sixty-inch wide belts help produce Reynolon plastic film. Even at this extreme width, the belts must stay flat. "Crowned" metal could snap like an oil can and damage the plastic.

Republic metallurgists worked closely with Reynolds Metals Company, Plastics Division, to develop this unusual equipment. If you have process or product problems involving heat, corrosion, surface finish or strength, ENDURO Stainless Steel quite likely is your answer. Republic metallurgists will help you apply it most profitably. Write Republic.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

GRIP OF STEEL. The steel reinforcing of the tire bead, upon which pneumatic rubber tires are built and which grip auto wheels securely, is made of high-quality CF&I-Wickwire Pneumatic Tire Bead Wire.

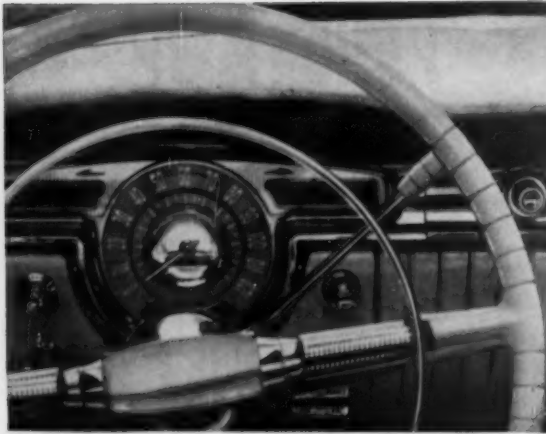


from tires to jar tops . . . wire works wonders

WELL PRESERVED. The wire closure on these glass preserving jars holds the tops tightly, maintaining the air-tight seal. This clamp is made from CF&I-Wickwire Galvanized Clamp Wire.



**CF&I-WICKWIRE
MAKES WIRE FOR
THOUSANDS OF USES**



FLEXIBLE POWER. Speedometer cable is made of criss-crossed layers of CF&I-Wickwire Flexible Shaft Wire.



SHADES OF NIGHT. The curtain springs in window shade rollers are made from tempered CF&I-Wickwire Spring Wire.



ALL WRAPPED UP. CF&I-Wickwire Baling Wire is used in baling hay, straw, and other bulky farm products.



TO PLUMB THE DEPTHS. An invaluable part of every plumber's kit is his plumber's snake made of CF&I-Wickwire Snake Fishing Steel Wire.

It's no wonder that wire is all-important in hundreds of different industries...for its properties can be custom-tailored to just about any need. Are you concerned with assembly work, manufacturing, processing? Do you require wire that's fine or coarse, hard or soft, round or shaped? Then the chances are excellent that a

CF&I-Wickwire Wire will more than fill the bill.

CF&I-WICKWIRE, with over a century of experience in the manufacture of wire, is always ready to serve you from plants conveniently located from coast to coast. Call or write our nearest district sales office for detailed information.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver
El Paso • Ft. Worth • Houston • Lincoln (Nebr.) • Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia



3147

COLLECT IT

AS IT ACCUMULATES — SOLIDS, POWDERS, SLUDGE, LIQUIDS
RAW MATERIALS, FINISHED PRODUCTS, WASTE MATERIALS



Heavy waste is dumped into an open container at a foundry in New York. The first step in the LOAD LUGGER SYSTEM of materials handling is to place a number of containers at strategic points to collect material as it accumulates, reducing handling at the point of origin.



Light material accumulates in an open container with high sides at a shipping carton plant in Louisiana. Rugged LOAD LUGGER containers are built of welded steel, have deep leak-proof bottoms, hold from 1½ to 14 cubic yards and more, and handle all types of material.



It is easy to load this 14-cubic-yard LOAD LUGGER container of a St. Louis contract hauler. It fills to the top without raking and is wind-proof and rain-proof. A model with rubber seals and latches is also theft-proof, fly-proof, dust-proof, and almost odor-proof.

PICK IT UP

ALREADY LOADED — NO LOST TIME AND NO LOADING CREWS
LET ONE TRUCK AND DRIVER DO IT ALL — REPLACING MANY



A full container is picked up at a refinery in Indiana. The second step in the LOAD LUGGER SYSTEM is for one driver and his truck equipped with a hoist-body to pick up full containers on a regular schedule. This procedure does away with lost time and loading crews and eliminates the need for several conventional trucks and their drivers.



A bearing manufacturer in Ohio picks up a full container of dolomite. LOAD LUGGER hoist-bodies (flat-bed truck bodies with a pair of hydraulic-powered hoisting arms) handle pay loads of up to 18,000 pounds and more. They are easily mounted on any truck chassis of suitable capacity, and all controls are installed in the cab.



An open container used for accumulating industrial wastes is picked up by a Chicago contract hauler. For greater safety, LOAD LUGGER hoist-bodies lift containers with four-point suspension and have double-acting hydraulic cylinders for positive control at all times.

LOAD LUGGER®

• FLAT-BED TRUCK BODIES WITH HYDRAULIC HOISTING ARMS

• LEAK-PROOF TILT-DUMP CONTAINERS FOR BULK MATERIALS



HAUL IT

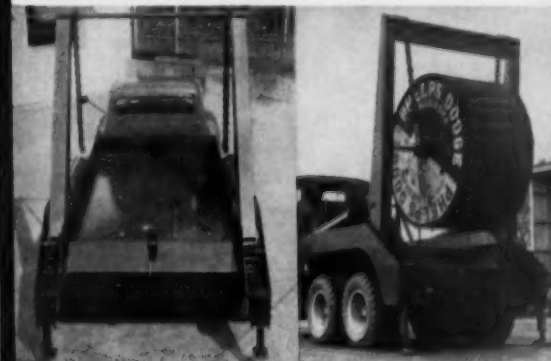
IN MANY TYPES OF CONTAINERS—OR ON THE TRUCK BED
IN PLANT AND OVER THE ROAD—ON YOUR TRUCK CHASSIS



A city truck in Ohio hauls a full container of repair materials. Government approval is evidenced by the many such municipal, state, and federal installations. Hauling full containers is the third step in the LOAD LUGGER SYSTEM, and over-the-road hauls are as feasible as in-plant because of the use of standard truck chassis.



A full container of residue materials is hauled at a corn products processing plant in Illinois. LOAD LUGGER hoist-bodies carry containers well forward for correct load distribution and cradle them between steel sidewalls for greater travel safety.



LOAD LUGGER hoist-bodies also carry materials or equipment directly on their flat beds, loading and unloading heavy objects with their hoisting arms.



This special hoist-body of a Michigan telephone company transports heavy cable reels. Such new uses for LOAD LUGGER equipment are constantly being developed.

DUMP IT

BY TILTING CONTAINER VERTICALLY OVER REAR APRON, OR
DELIVER IT BY EXCHANGING FULL CONTAINER FOR AN EMPTY



Spent solvents are dumped into incinerator tank at a drugs and medicines manufacturing plant in Michigan. Delivering full containers or dumping their loads is the fourth step in the LOAD LUGGER SYSTEM. Returning empty containers then completes the cycle.



Metal scrap is dumped and spread in the yards of a scrap metals service company in Iowa. LOAD LUGGER hoist-bodies handle more pay load on a given truck chassis, because they are lighter than comparable equipment. And their patented simplicity, clean design, and sturdy construction make them cost less to buy and maintain.



Equipment of a Miami contract hauler in the dumping position. The LOAD LUGGER hoist-body has outrigger jacks to protect rear springs and axles from injury while picking up and putting down heavily loaded containers, but it neither needs nor uses these jacks while tilting container over rear apron to dump or spread the load.

ENGINEERED, MANUFACTURED, AND MARKETING BY

Ingersoll

KALAMAZOO DIVISION

SUCCESSOR TO BROOKS EQUIPMENT & MFG. CO.

BORG-WARNER CORPORATION

EXPORT SALES: BORG-WARNER INTERNATIONAL CORP., CHICAGO

INGERSOLL KALAMAZOO DIVISION

For more information mail this coupon to: 1820 N. Picher St., Kalamazoo, Mich.

Name and position

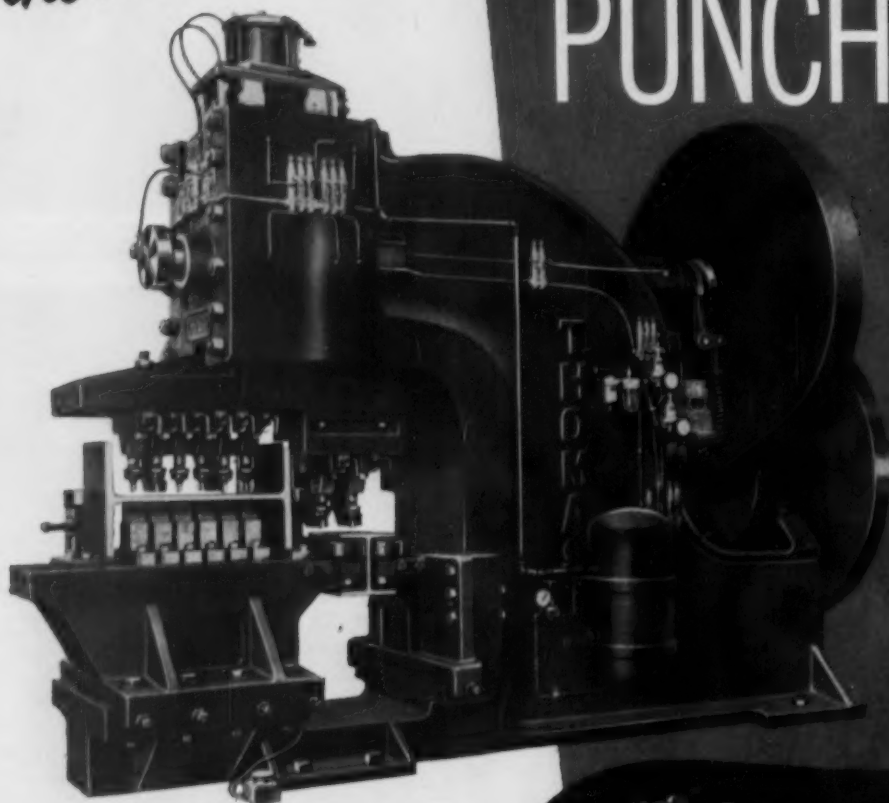
Name of company

Street address

City, zone, state

the trend is to **THOMAS**

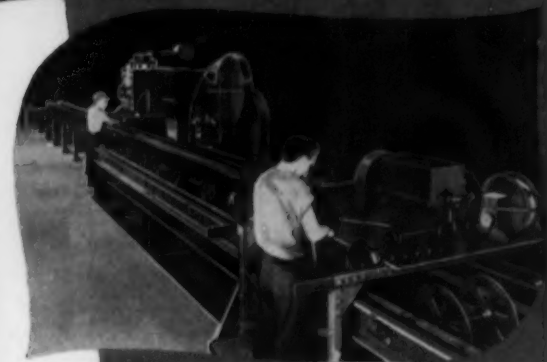
for the most modern in **BEAM
PUNCHES**



Modern design and quality construction...these are the factors required to lower your punching costs. You'll find these advantages in the Thomas line of new Beam Punches...in models of from 100 to 400 ton capacities.

Multiple tool setups for flanges and webs permit continuous operation through a wide range of sizes without money-consuming delays for tool changes. Quality construction throughout provides insurance against costly down time!

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.



Write for
details!

The Thomas Beam Punch-Motorized Spacing Table combination produces the ultimate in production efficiency for the medium tonnage shop. With the Spacing Table, accurate hole spacing is assured without layout, and material handling is reduced to the bare minimum.

Punches • Shears • Presses • Benders • Spacing Tables

40

VELVETRACE
PRATT & WHITNEY
MILLING MACHINE

NEW! UNIQUE! PRECISE!

PRATT & WHITNEY VELVETRACE

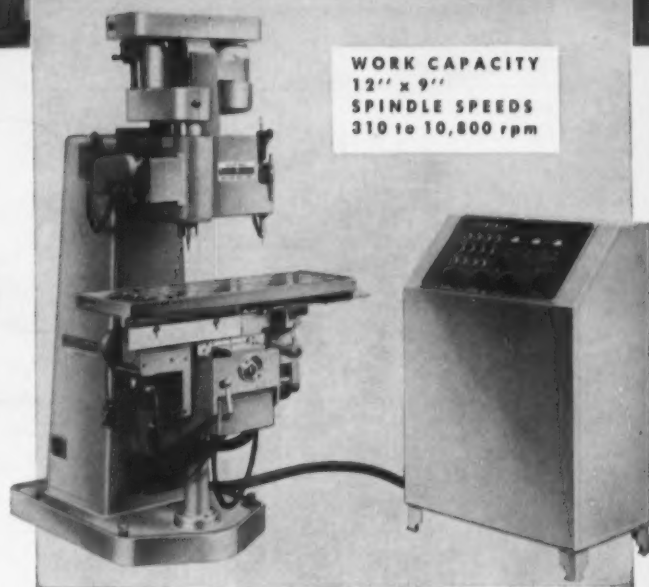
MILLING MACHINE

AN ENTIRELY NEW, UNIQUE TYPE OF

TRACER CONTROL . . . follows the finest detail of any 3-dimensional model with extreme accuracy . . . but **WITHOUT TOUCHING IT**. Utilizes a short spark gap between tracer and model for control. Cannot damage any model, however soft or fragile, even when using the smallest diameter tracer. There is no mechanical motion in the tracer . . . and therefore no positional offset or time lag.

AUTOMATIC OPERATION

Spindle, table and carriage are driven through new type, specially designed magnetic clutches which provide maximum sensitivity, continuously variable speed control, and eliminate backlash. Machine can be set to cut 3-dimensional shapes (including square walls) automatically with either table travel and carriage feed, or carriage travel and table feed. Spindle quill "roll feeds" in precision preloaded ball bearings . . .



WORK CAPACITY
12" x 9"
SPINDLE SPEEDS
310 to 10,800 rpm

assuring that original high accuracy and rigidity are maintained indefinitely.

SEND NOW FOR COMPLETE INFORMATION

Write on your Company letterhead for your free copy of Circular No. 590 . . . or phone the P&W Branch Office nearest you.



PRATT & WHITNEY COMPANY

INCORPORATED

Charter Oak Boulevard, West Hartford, Connecticut

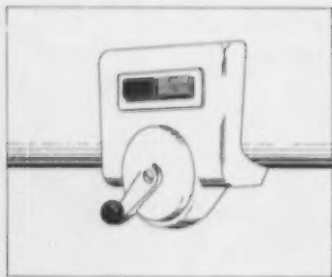
BRANCH OFFICES . . . BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI
CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH
ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., WEST HARTFORD

MACHINE TOOLS • GAGES • CUTTING TOOLS

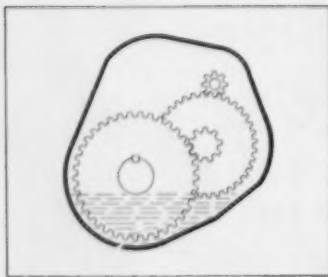
2 New CINCINNATI PRESS BRAKES

THIRTY TON - - - - 2-30 SERIES
FIFTY TON - - - - 3-50 SERIES

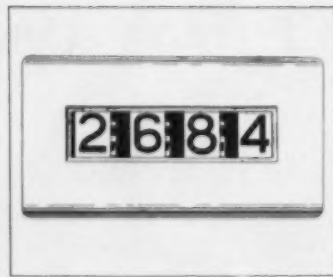
COMPETITIVELY PRICED



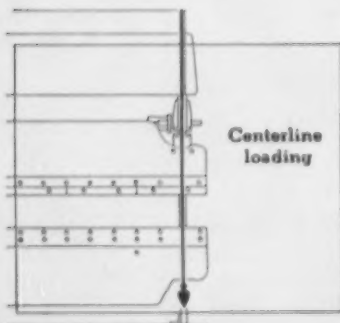
Front controlled, variable speed drive, 20 to 50 strokes per minute.



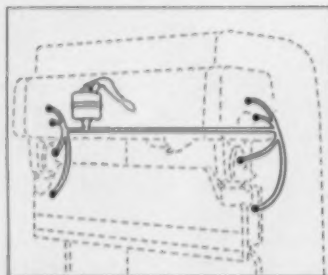
Completely enclosed transmission, running in oil.



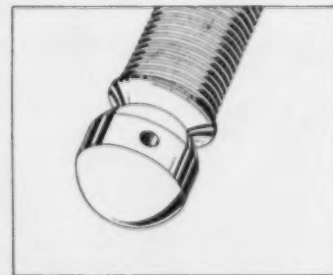
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6' mild steel.

Look at these unusual standard features:

2½" stroke—12" shut height—9" throat.

Distance between housings 5'-2"—overall die surface, 6'-0".

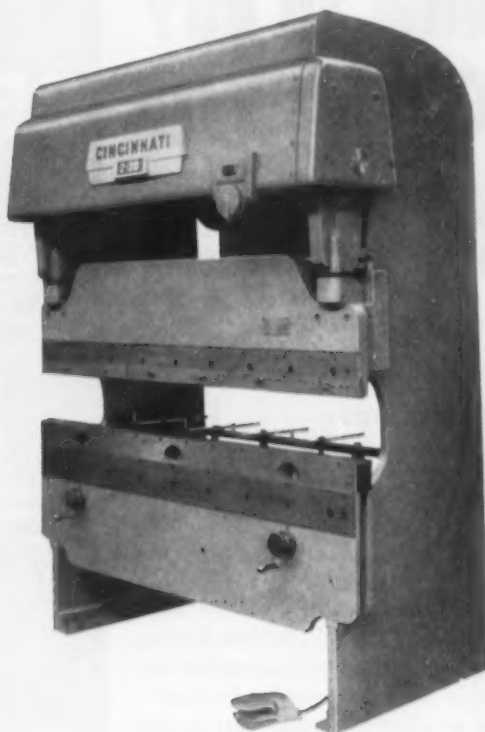
Front controlled, variable speed drive, 20 to 50 SPM. 4" manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾" angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6' mild steel. Investigate these unusual standard features: 3" stroke—12" shut height—12" throat—distance between housings 6'-6" or 10'-6"—overall die surface 8'-0" or 12'-0"—front controlled, variable speed drive, 20 to 50 SPM.

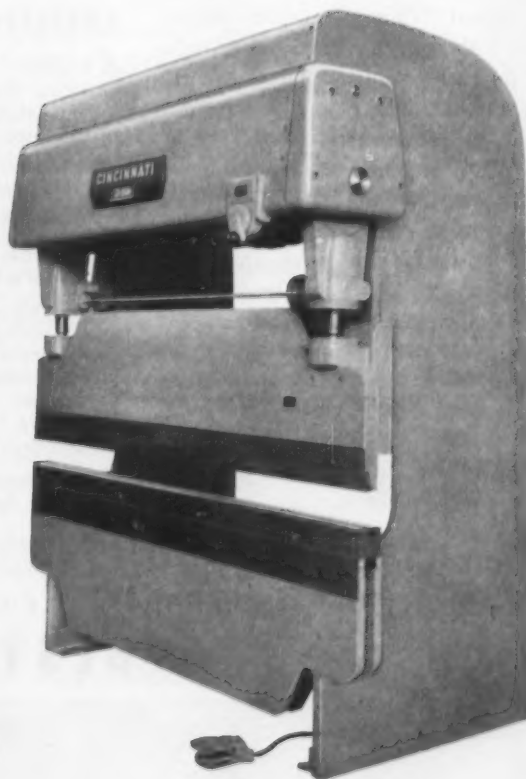
5" motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾" angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



HOW TO BUY CONVEYOR

and get...

MORE USE PER DOLLAR

where

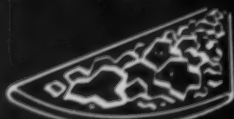
**SPECIAL ENGINEERING
is needed**

Look for a make of belt backed by experienced, specialized engineering service.

Selecting the right conveyor belt to solve a special problem begins with selecting the right representative... one who will take interest in your particular belt needs and refer your problems to his factory if engineering help is required. Where a company makes a wide selection of conveyor belts for many applications, the representative can often recommend a feature construction to meet your job requirements. Where your problem is unique, that company backs its field men with custom engineering and comes up with a recommendation to meet your specific operating conditions.

Choose the company that offers complete belt engineering service... the source of supply that maintains close contact between factory and field.

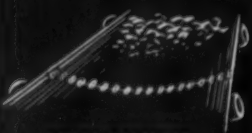
BELTS



GOOD TROUGHING



IMPACT RESILIENCE



HOLDS FASTENERS



RAYBESTOS-MANHATTAN CONVEYOR BELT ENGINEERING

A leading steel mill, faced with handling hot sintered ore without an insulating layer of "fines", had numerous belt failures due to charring.

An R/M representative called in a factory engineer. A new custom-engineered R/M conveyor belt with special cover now saves hundreds of dollars a year at the mill.

and... where hot ash and clinker was wearing out a conveyor belt every month at a Michigan cement plant, an R/M field man was able to furnish a specially engineered Homocord Belt which has outlived the best previous belt four times over.

and... special, "chevron cleated" conveyor belt was developed by

R/M, as a result of a field representative request, to replace a smooth surfaced belt unable to carry wet iron ore up a mine slope without costly spillage.

These are just a few of many instances where R/M engineering service has solved conveyor belt problems. In other cases, special job requirements have been met with R/M's exclusive constructions such as extra-flexible Ray-Man "F"... extra-cushioned Homocord for shock-loading... and Ray-Man Tension-Master for extra-high tensions and long lifts.

Let an R/M representative show you why R/M engineering makes R/M Conveyor Belts last much longer... give you "More Use per Dollar".

**R
M**

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Flat Belts



V-Belts



Conveyor Belts



Hose



Roll Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

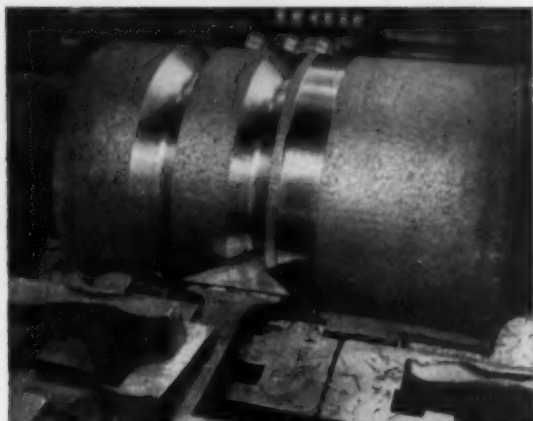


TIPS FROM A ROLL MAKER'S NOTEBOOK

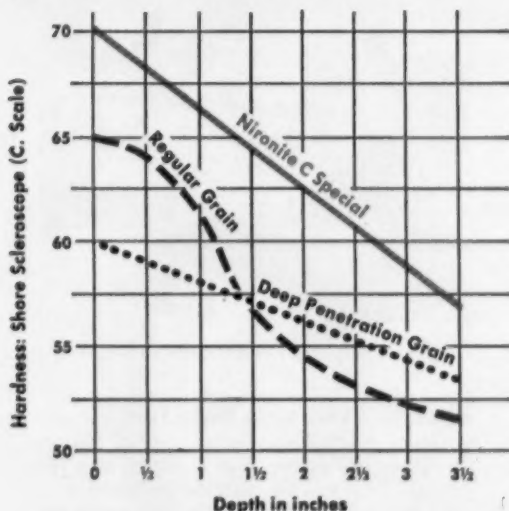
MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

How to pick rolls for bar and billet mills



The crux of the problem—Roughing a pass in a roll for a bar mill.



Generalized curves show how hardness decreases below the surface of three types of roll.

Like all rolls, those for the intermediate and finishing stands of bar and billet mills must possess the best possible balance of strength-vs.-hardness. However, they cannot be chosen on this basis alone.

The problem is complicated by the shape and depth of the passes. Many rolls must be cast plain because of the size of the passes or because of the roll user's need for plain rolls which may be turned for any section. Hence, large amounts of metal must be removed during turning.

As a result the metallurgist strives for two prime objectives in rolls for these applications. They are (1) the greatest possible depth of hardness and (2) fine grain structure to provide smoothness of work surface at the bottom of the passes.

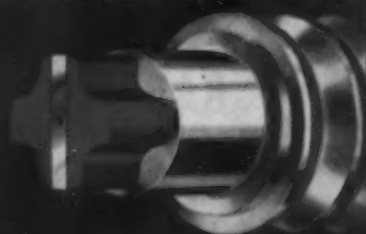
A practical solution—The Nironite C Special roll is the answer that Mack-Hemp has developed to meet this problem. In this indefinite chill nickel-chromium alloy iron roll, depth of penetration is achieved by careful control of the carbon content. This results in deep penetration as well as less and finer graphite in the solidified iron. Hardness decreases very gradually as distance from the surface increases (see graph at left). Thus, this manipulation of carbon provides excellent wear resistance even at the bottom of deep passes. And the low graphite content which is assured by this special composition provides excellent surface condition at depths well below the original surface.

Nironite C Special rolls are only one example of the way Mack-Hemp can combine metallurgical research with nearly five generations' experience in the "art" of roll making to improve the performance of modern rolling mills. For help with your special rolling problem, write us today.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

DIVISION OF E. W. BLISS COMPANY

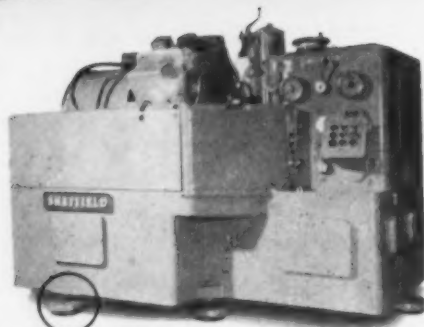


42 MANUFACTURERS *at the Tool Show* PROVED BARRY MOUNTS BOOST PRODUCTION — CUT COSTS



VIBRATION STOPS HERE

400-TON BLISS PRESS "FLOATS" ON BARRY MOUNTS. With no special foundation, or floor preparation, this knuckle-joint press weighing 26,500 lbs. was installed, leveled, and ready for demonstration in less than 30 minutes. The saving in cost of installation for this and two other giant presses far exceeded the cost of the Barry Leveling Mounts used — with the plus value of freedom from frame stresses met in lagged down installations.



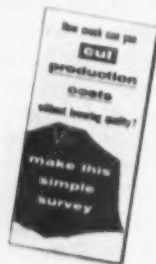
VIBRATION STOPS HERE

CONSISTENT HIGH-QUALITY PRODUCTION to extremely close tolerances was demonstrated in the Sheffield precision gear grinder exhibit without interference from the pounding of huge heavy-impact presses in adjacent show spaces. With Barry Leveling Mounts isolating the grinders from floor-borne shocks, one operator said, "This machine is performing excellently. I'm getting *no rejects*".

YOU CAN GET MORE and BETTER PRODUCTION

and lower costs in YOUR plant — even if you have problems as tough as any met by machine-tool builders at the Chicago show.

This FREE check-chart shows proved cures for such dollar-eaters as:



- Frozen machine layouts
- Too much downtime
- Machine duplication
- In-line maintenance
- Building-borne vibration
- Slow machine speeds
- Idle space
- Excessive noise

Write for free copy of Barry Plant Survey Chart SA-755 and Product Bulletin 546.

SOLD THROUGH INDUSTRIAL DISTRIBUTORS

Barry's expansion program offers engineering opportunities at all levels in all departments.



VIBRATION STOPS HERE

HIGH-SPEED, POWER SHEAR PRODUCTION by Famco was made easy to display by use of Barry Mounts. Installation and leveling was a matter of a few minutes. Then, with day after day operation at up to 85 strokes per minute, the shear did not "walk" . . . while vibration-sensitive lathes and grinders in nearby booths were reported unaffected by the high-speed, heavy impact.

BARRY CONTROLS incorporated 795 Pleasant St. Watertown 72, Mass.



**How a
shift in
gears saved
\$256,000**

**Five million MUELLER BRASS CO. forged ring
gears improve automatic transmission operation . . . at lower cost to the manufacturer.**

Ever since one of the leading manufacturers of automotive transmissions began using ring gears forged from Mueller Brass Co. bearing bronze, production costs have been cut nearly \$256,000. That's because the rough forging weighs less and is closer to finished size than a sand cast ring gear formerly used. This shift in gears resulted in a savings in metal costs, greatly reduced machining time and increased tool life. In addition, the use of forged gears has cut scrap loss and eliminated costly inspection rejects.



The performance of these forged ring gears is also far superior to the sand cast gear, which had a tendency to flake away and crack around the teeth, causing failures. More than five million forged ring gears have now been used in these transmissions without a single failure. Being porous, the sand casting was difficult to balance, but the forging has a dense, homogeneous structure that helps keep it in perfect balance.

Strong, long-wearing non-ferrous metal parts, forged to your specifications by Mueller Brass Co., can help reduce your costs and improve the performance of your products just as they have done in this transmission application. For complete information, write us today.

Write today for your complete set of Mueller Brass Co. engineering manuals.

MUELLER BRASS CO. PORT HURON 24, MICHIGAN



November 17, 1955

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41

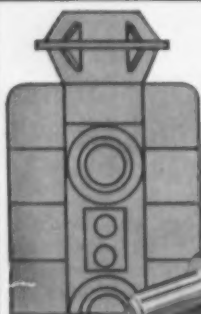
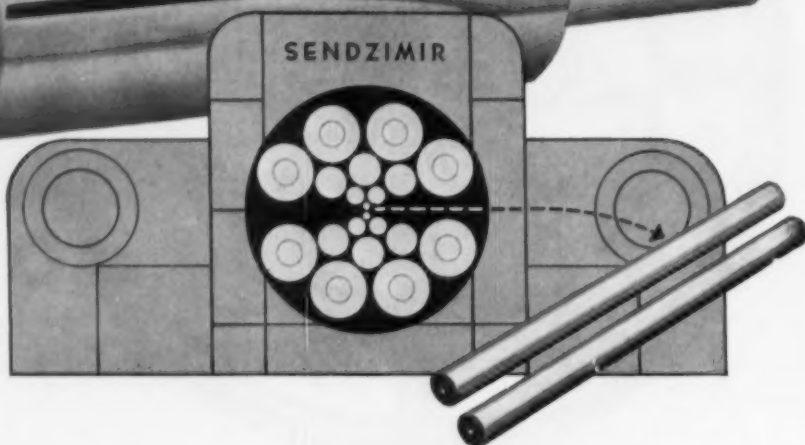
ALL ROLLING MILLS NOW USE **Talide** WORK ROLLS



FOR EVERY TYPE FINISHING MILL

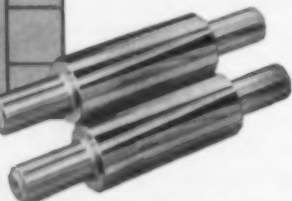
During the last five years Talide rolls have been adopted by every major strip steel producer. Metal Carbides pioneered and developed tungsten carbide rolls and successfully adapted them to all types of rolling mills including STECKEL, BLISS, UNITED, MESTA, STANAT, SENDZIMIR, WATERBURY-FARREL, TORRINGTON, RUESCH, FENN, WEAN, COLD METAL, etc.

Talide rolls have proven far superior to both steel rolls and carbide rolls of any other make.



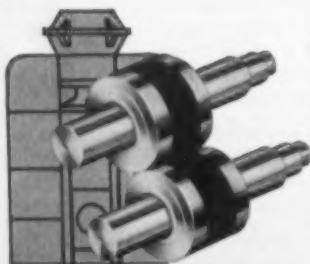
168 to 7 hours

Leading Ohio strip steel producer averages 750 coils of various types and analyses between grinds, enabling them to operate their cold rolling mill continuously without roll changes for 7 days, 3 turns per day. Previous steel rolls used averaged 8-8 hours, necessitating 3 or 4 roll changes per day with considerable downtime.



210 to 5 days

Large Mid-Western producer of chrome-nickel alloy flat wire is averaging 7 months' continuous service between grinds compared to 5 days average run with steel rolls. Among other advantages, customer reports improved surface finish adds to sales appeal of finished product, fewer anneals are required to produce desired reduction, and wire runs cooler, resulting in less oxidation.



ROLL REPAIRING

Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Send for new 84-page catalog 55-G

Talide work rolls are ultra-hard, extremely dense, and porous-free. Manufactured from highest purity tungsten carbide powders, the surface finish of a Talide roll is smoother than one micro-inch. Hard as a diamond, it will take a "bigger bite" than a steel roll. Strip steel of all analyses can be rolled down to thinner gauge, with more accuracy, greater reductions and with fewer anneals than possible with any other roll.

All users of Sendzimir rolling mills have adopted Talide work rolls because operating results have been phenomenal, far surpassing all expectations. The higher initial cost of Talide rolls is offset many times by the very substantial savings realized in less downtime, fewer regrinds, reduced scrap, reduced strain and stress load on back-up rolls, bearings and mill housings.

Tremendous production runs are commonplace with Talide rolls with mill after mill reporting increased tonnage-runs between roll changes of 278-1, 179-1, 82-1, etc. Metal Carbides Corporation, Youngstown 7, Ohio.



SPECIAL DIAMOND WHEEL for ROLL GRINDING

The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-6 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter.



HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • CERMETS • HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Forging: COPPER • BRONZE • ALUMINUM • MONEL AND STAINLESS STEEL

**DIE LIFE
INCREASED
UP TO
400%**



Heating for forging 1" stainless hex-head machine bolt blanks with 10,000 cycle TOCCO Induction Heating Unit. Photo—courtesy The H. M. Harper Co.

with TOCCO* Induction Heating

● Naval Bronze, Silicon Bronze, Copper, Aluminum, Monel and all types of stainless steel are heated for forging at the H. M. Harper Co., Morton Grove, Illinois. Regardless of material TOCCO can be profitably applied to brazing, heat-treating and forging operations in almost any metal-working plant.

PRODUCTION UP—In addition to the very important savings in forging dies, TOCCO has increased production to as much as 265% of output possible with former heating methods. On the 1" type 303 Stainless machine bolt blanks

shown here TOCCO upped production from 75 to 200 parts per hour, using 35 K.W., 10,000 cycles.

VERSATILE—The same TOCCO machine is used on stock of $\frac{3}{8}$ " to $1\frac{1}{4}$ " diameter; heated zones vary from $\frac{1}{2}$ " to 4". TOCCO'S automatic timing cycles provide complete uniformity of heating throughout both length and cross section—assuring a uniformly high quality product.

Why not have a TOCCO Engineer investigate your plant to determine where TOCCO can cut your costs and streamline your production?

THE OHIO CRANKSHAFT COMPANY



TOCCO

**NEW FREE
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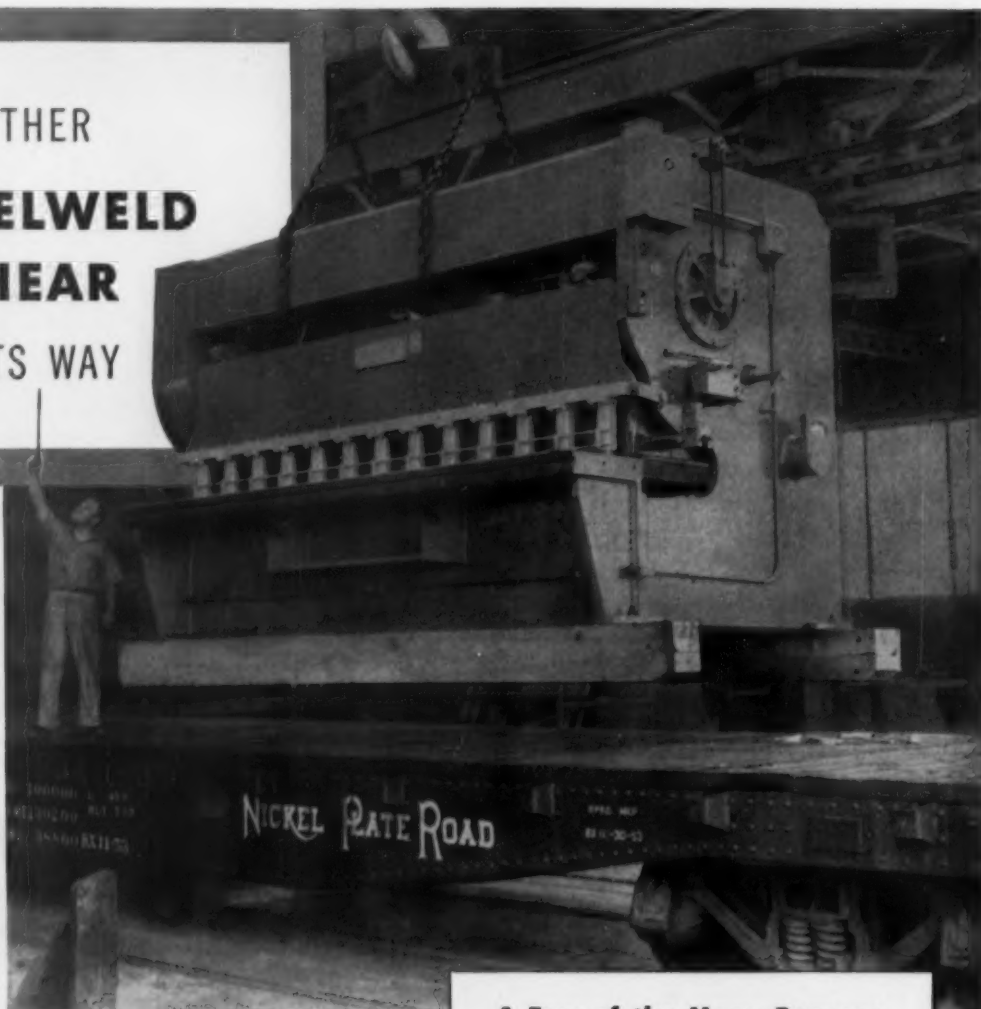
THE OHIO CRANKSHAFT CO.
Dept. A-11, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Heating for Forging and Forging".

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ANOTHER STEELWELD SHEAR ON ITS WAY

From every angle a Steelweld shear looks good — and is good. This machine is rated for 12'-0" x 1½" steel



SHIPMENTS are being made at a rapid rate to all parts of the country because more and more users are learning of the many merits of Steelweld Shears and are talking about them. As the words of experience spread about and comparisons are made, more and more people come to realize that Steelweld Shears are really outstanding.

For smooth, accurate burr-free cutting, Steelwelds can't be beat. For ease of operation they have no peer. Their heavy construction and means for simple, easy maintenance assure long trouble-free life.

For the finest in shearing, you can't make a better selection than Steelweld. Say the word and we'll have one of these wonderful machines on the way to you.

A Few of the Many Reasons For STEELWELD'S DEMAND

1. Pivoted-blade operation. Entirely different from every other shear. No slides or guides to wear and cause inaccuracies.
2. Micro-set knife adjustment. Quick easy knife-clearance adjustment for every plate thickness. Something not matched elsewhere. Be sure to get the complete story on this.
3. Mechanical hold-downs. Tight gripping, non-leaking, quiet operating.
4. Accurate easy operating back gauge rides on ball bearings.
5. Cool-operating, long-life, low-inertia clutch and brake.
6. Heavy all-welded rigid one-piece steel frame.

AVAILABLE FOR PLATE LENGTHS TO 24 FEET AND THICKNESSES TO 1½ INCH



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THE CLEVELAND CRANE & ENGINEERING CO.

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STEELWELD PIVOTED BLADE SHEARS

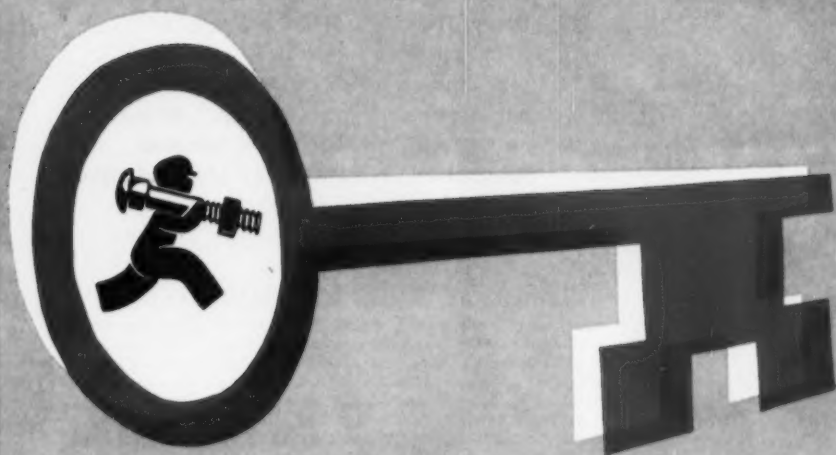
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You Can Key Your Needs for More Than 200,000 Different

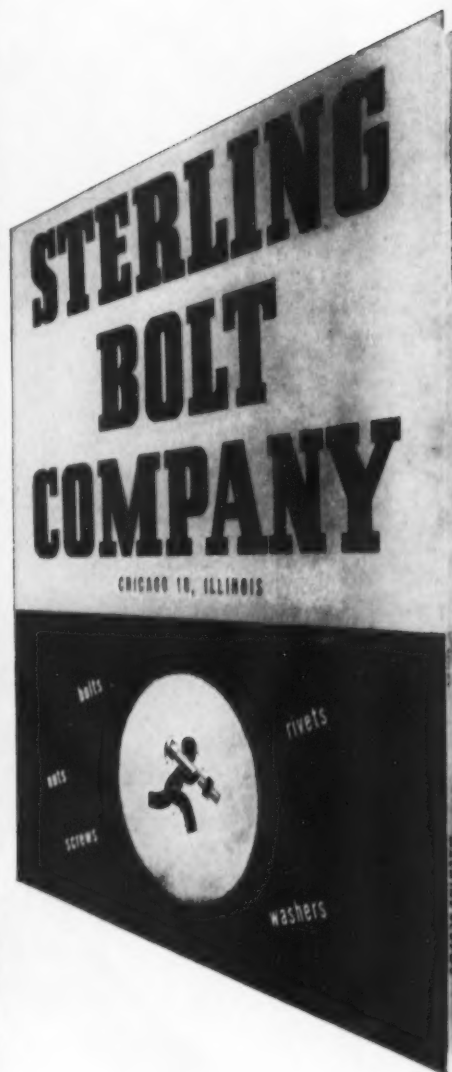
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Super-strong . . . amazingly shock-resistant! "SCOTCH" Brand Filament Tape has up to 500 lbs. tensile strength per inch of tape width . . . can give and recover under repeated impact to more than withstand the requirements of heavy-duty packaging and materials handling. Furthermore, the exclusive "mirror-surface" adhesive sticks at a touch . . . holds firmly. Truly a "tool" of industry, "SCOTCH" Brand Filament Tape is daily finding new uses in metalworking plants: for banding, holding, reinforcing, palletizing . . . to name just a few. Use the coupon for complete information on how it can cut costs and make tough jobs easier in your plant.

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"SCOTCH" Double-Coated Tapes: tapes that stick on both sides for bonding, mounting, laminating.

"SCOTCH" Acetate Fibre Tape: long-aging, moisture-resistant, actually sticks at below-freezing temperatures.

"SCOTCH" Plastic Tapes: eight vivid colors; thin, tough, stretchy; resist acids, alkalies, common solvents.

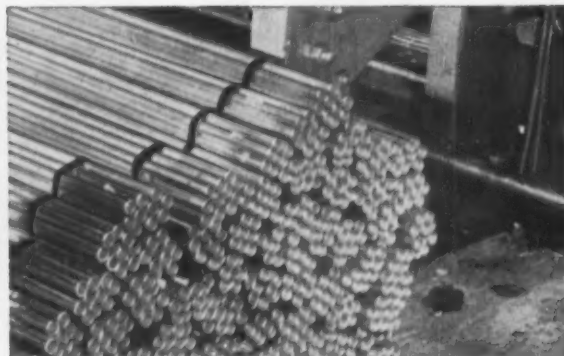


BRONKO NAGURSKI, all-time all-American football great and former world's heavyweight wrestling champion.

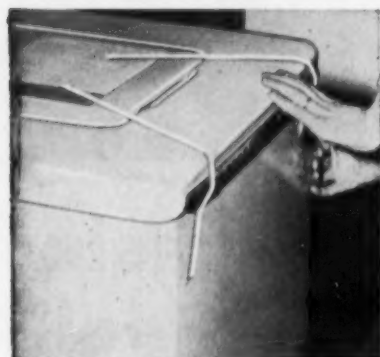
Strongest Tape?



Bulky objects are easily wrapped and secured with "SCOTCH" Brand Filament Tape. Above: as automobile bumpers are lowered into wrapping cradle, automatic dispensers deliver predetermined lengths of $\frac{3}{8}$ " tape to workers. Easy, dependable and economical wrapping at production-line speeds.



Production-line bundling of conduit, rigid wall pipe, or bar stock is possible with "SCOTCH" Brand Filament Tape and automatic bundler. Machine wraps three bundles a minute. Tight-holding "SCOTCH" Filament Tape sticks securely; can be used on odd and irregular-shaped metal pieces as well.



Stain-resistant, "SCOTCH" Brand Filament Tape can safely be used on porcelain or enamel surfaces. Above, same tape that secures washer door in transit also holds operating instructions. Use it for holding drawers, panels and small parts in place during shipment. Tape won't scratch; holds firmly.



Reinforcing heavy cartons and packages is an everyday job for "SCOTCH" Brand Filament Tape. Tape won't cut into or crush cartons and contents; is easily applied without danger of cutting workmen's hands; is easy to dispose of by receiver. Positive, safe closures; dependable reinforcing!



In materials handling, "SCOTCH" Brand Filament Tape can palletize. One or two complete bands of tape securely hold cartons; make handling and stacking easier, faster. Note: Other "SCOTCH" Brand Tapes can also save time and money for you. Use the coupon for complete information.

Order "SCOTCH" Brand Tapes from your regular distributor, or use this coupon for complete information

There are more than
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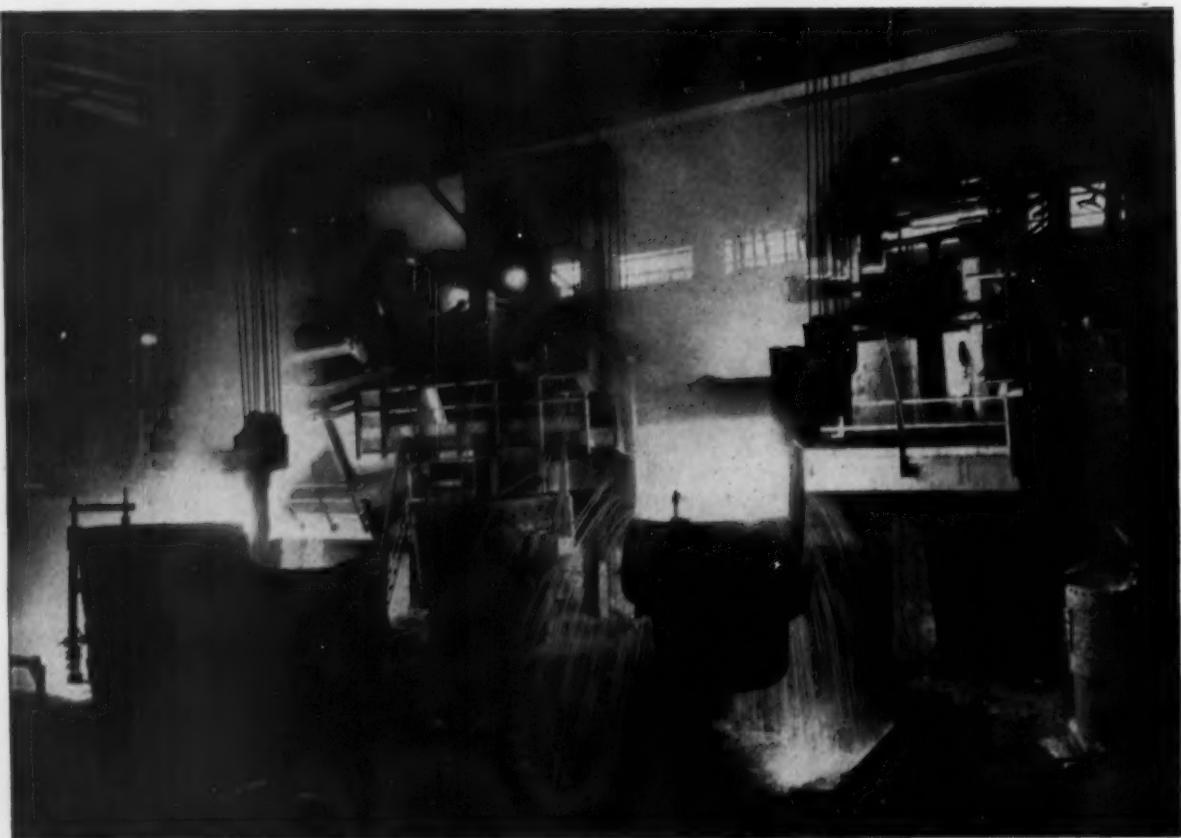
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"Cities Service Heat Prover helps make special steel, saves fuel"



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Not an instrument that you buy...
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FREE!

Crucible Steel Company of America is another leading steel company that has found the Cities Service Heat Prover a valuable aid in its furnace operation.

Here's what Crucible has to say about the Heat Prover at its Midland Works, one of several where it is in constant use.

"The Heat Prover has become our standard tool for the setting up and checking of combustion controls on our many furnaces at Midland. It has also helped immensely in setting up special atmospheres for special grades of steel by providing fast and reliable analyses, and has been particularly instrumental in the improvement of fuel economy. Cities Service has kept the Heat Provers in perfect running order and on many occasions has gone out of its way to help us."

You, like Crucible Steel, can achieve better results in *your* furnace operation with the Cities Service Heat Prover. Supplied and maintained free by Cities Service, it offers easy portability, rapid continuous sampling, simultaneous reading of oxygen and combustibles. For more information, talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

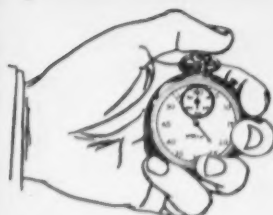
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Sterling pre-tested resinoid or vitrified snagging wheels are precision-built to the demands of your job. Created to save time and money, they do just that! Every snagging "Wheel of Industry" is freer-cutting on swing frame, automatic billet grinders, or stand grinders. These superior abrasive wheels win in comparative tests because they are individually designed to solve your particular

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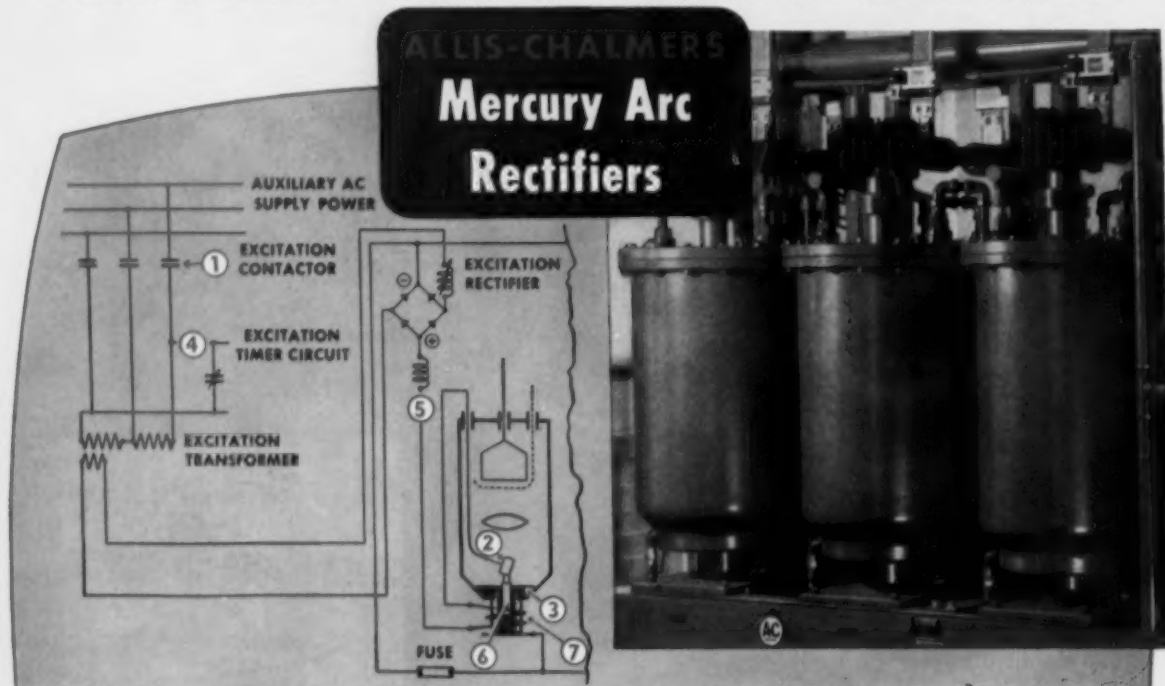
For Reliable Rectifier Operation Get Continuous Excitation

Allis-Chalmers excitron rectifiers eliminate the need for a pulse-type firing system timed for operation every cycle. Maintenance is easy because of the simplicity of design.

A small dc excitation arc is automatically ignited only once, when the unit is started, and then maintained on the mercury cathode of each rectifier tube.

It offers advantages similar to a pilot light. Since it is far easier to maintain an arc than to start it, this feature makes the excitron far less likely to lose excitation during power supply disturbances than other types of rectifiers.

Get all the facts about excitron rectifiers before your next installation. Call the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin.



Supply of DC Provides Key to Continuous Excitation

Direct current supplied from excitation rectifiers is the key to continuous excitation. When the excitation system is energized by means of a contactor (1), positive dc potential appears on the excitation anode (2) of each tube, negative at the cathode (3). A timer (4), through contacts of the excitation failure relay (5), is energized at the same time.

As soon as voltage is applied, current flows from the anode to the cathode through the ignition plunger (6). This current energizes the ignition coil (7) and causes the plunger to be pulled below the mercury surface. As the plunger

travels down, an arc is drawn which transfers from the graphite tip of the plunger to the mercury. This current flow keeps the coil energized, maintaining a continuous arc.

If excitation failure should occur while the rectifier is carrying load, the plunger is released, floating upward in the mercury until it makes contact with the anode, then repeating the process above until the arc is re-established.

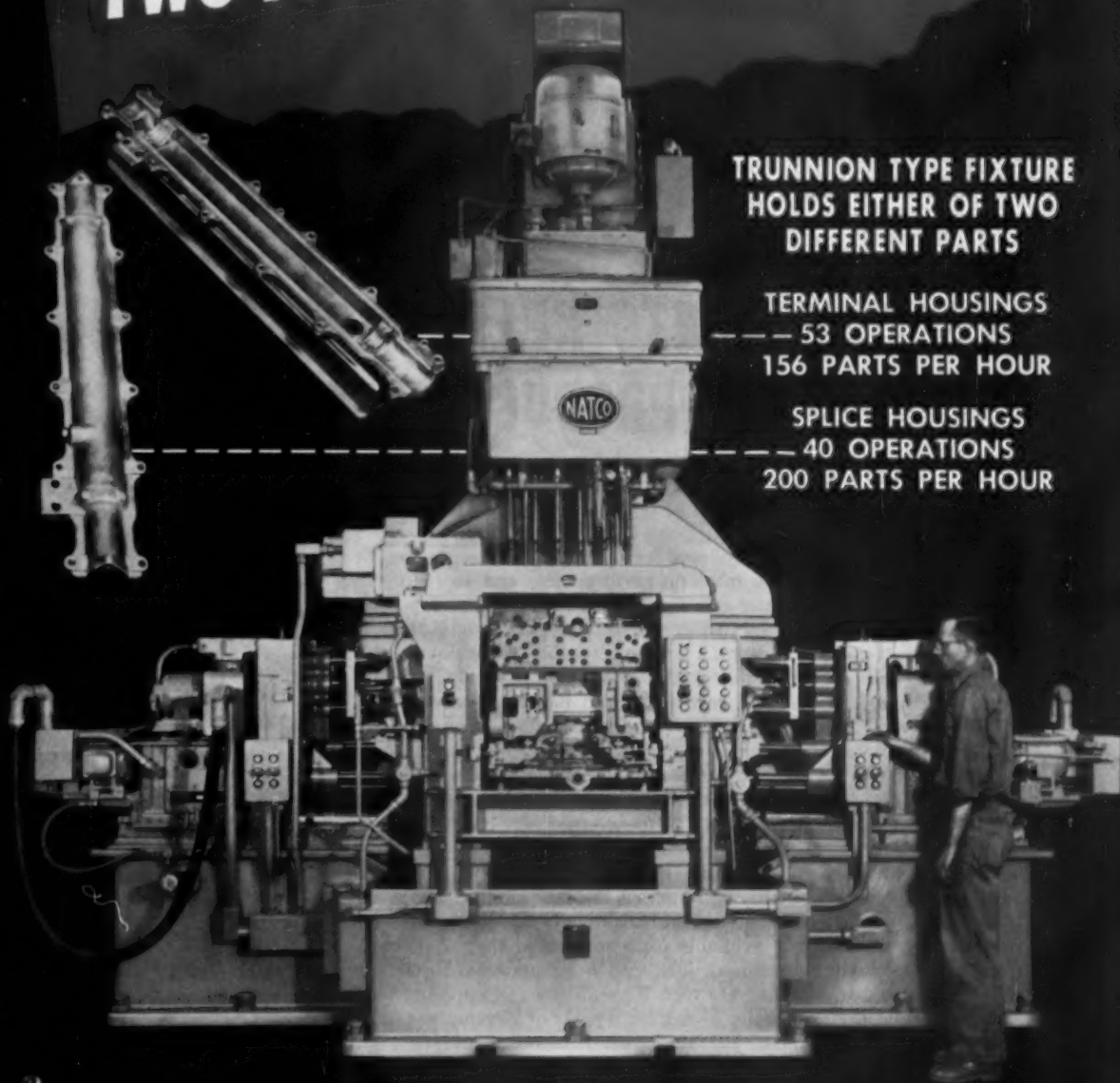
Re-establishment of the arc as outlined takes less than a second — it does not interfere with normal operation.

ALLIS-CHALMERS



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NATCO 3-WAY DRILLER and TAPPER COMBINES 93 OPERATIONS ON TWO PARTS TO REDUCE COSTS!



TRUNNION TYPE FIXTURE
HOLDS EITHER OF TWO
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TERMINAL HOUSINGS
— 53 OPERATIONS
156 PARTS PER HOUR

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— 40 OPERATIONS
200 PARTS PER HOUR

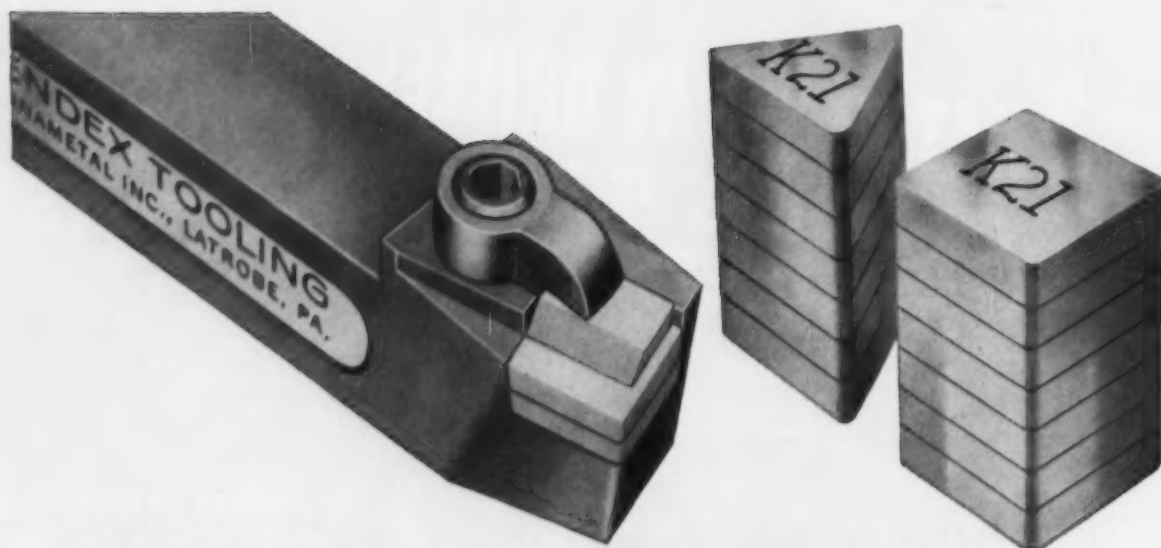
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THESE TWO RECENT KENNAMETAL* DEVELOPMENTS HELP TO MEET TODAY'S HIGH-SPEED PRODUCTION NEEDS

The profit advantages of today's high-speed automatic cycling machines for metal cutting are lost when tools wear rapidly—need frequent regrinding—or are cumbersome to index.

Kennametal recently introduced two new developments to help give you continuous machine performance, and to help step up profits in your steel-cutting operations. These developments are Kendex*† Button Tooling and Kennametal Grade K21.

Kendex "turnover" inserts, with replaceable Kennametal shims and new chip control system, double the number of cutting edges, eliminate all regrinding and index in seconds. These features help provide consistent tool performance and hold downtime to a minimum.

Grade K21 is the General Purpose steel-cutting carbide now outperforming all other medium grades in the carbide industry. Superior performance of K21 is due to exceptionally high edge strength, strong resistance to cratering and superior wear qualities. An extremely versatile grade, K21 can be applied to general steel-cutting, heavy roughing and finishing.

Kendex, in 17 styles and sizes; and K21, in popular blanks and inserts, are immediately available from stock. For their right application on your machining jobs, call a Kennametal Tool Engineer. He works exclusively with Kennametal . . . applying and servicing it. And be sure to ask for reports of Kendex and K21 repeat performances, job after job. KENNAMETAL INC., Latrobe, Pa.

*Registered Trademark

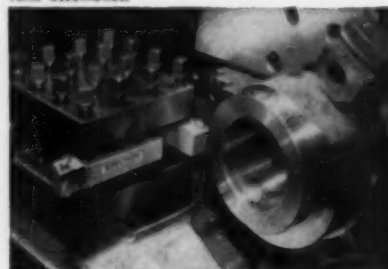
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9400

PROVED BEST—TEST AFTER TEST

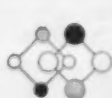


Kendex Tooling with "turnover" Inserts cuts tool cost from \$1.20 to \$0.09 per piece, turning SAE 4140 tank assemblies.



Grade K21—on interrupted cutting, roughed and finished 6 times as many pieces as other premium carbide.

Give your machines the tools they deserve . . . the BEST



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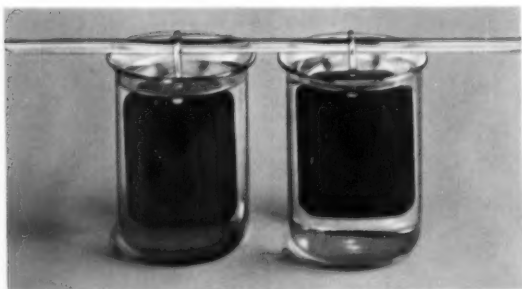
Efficiency of New Sun Rust-Preventive Grease is shown by accelerated test. Rusty test plate (left) was coated with ordinary grease. The large amount of



rust was formed during a 48 hour immersion in synthetic sea water. Plate (right) protected by new Sun rust-preventive grease is wholly rust free after 48 hours.

NEW GREASES PREVENT HARMFUL RUST

**Sun rust-preventive greases give improved lubrication
...protect against wet or humid operating conditions**



In 48 Hour Synthetic Sea Water Test, rust from plate coated with ordinary grease has turned water yellow (left). Water remains crystal clear in beaker with plate protected by new Sun rust-preventive grease (right).

Water contamination in grease-lubricated parts reduces lubricant life, promotes corrosive wear, and may lead to failure of bearing surfaces.

Sun Oil's new rust-preventive greases are specially fortified to overcome this problem. They give extra protection against both direct water contamination and indirect water contamination caused by high humidity and condensation during overnight and week-end shut downs.

Available at the price of ordinary greases, new Sun rust-preventive greases come in many different grades. For complete information, see your Sun representative, or write for Sun Technical Bulletin 38. Address **SUN OIL COMPANY, Philadelphia 3, Pa., Dept. GI-1.**

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PLEASE TURN TO NEXT PAGE



New buttery grease now protects against rust under highly adverse moisture conditions.



New tacky grease prevents throw-off...reduces consumption. Highly resistant to water.



New high-temperature grease for anti-friction bearings. Exceptional stability, longer life.

NEW SUN RUST-PREVENTIVE GREASES SAVE YOU MONEY IN 3 WAYS

- Prevent wear...and rust...on 90% of all grease jobs
- • Serve as low-cost rust preventives for storing shop equipment
- • • Save storing and handling special-purpose greases

Sun Oil Company's new greases are fortified to protect against rust. Lubricity is improved and wear is reduced because grease-lubricated parts are now protected at all times against rust and corrosion caused by condensation and process water.

The effective life of these new rust-preventive greases is approximately twice that of conventional greases operating under wet conditions. And, their extra protection against moisture permits their use as a rust-proofing medium for shop storage of tools and parts.

Competitively priced with ordinary greases, these new greases can be applied by any conventional method...brush, swab, pressure gun, or through central pressure systems.

Because of their improved quality, these new Sun greases will now perform 90% of all grease lubrication jobs. You reduce grease inventories...lessen the risk of using the wrong grease...simplify your handling problems.

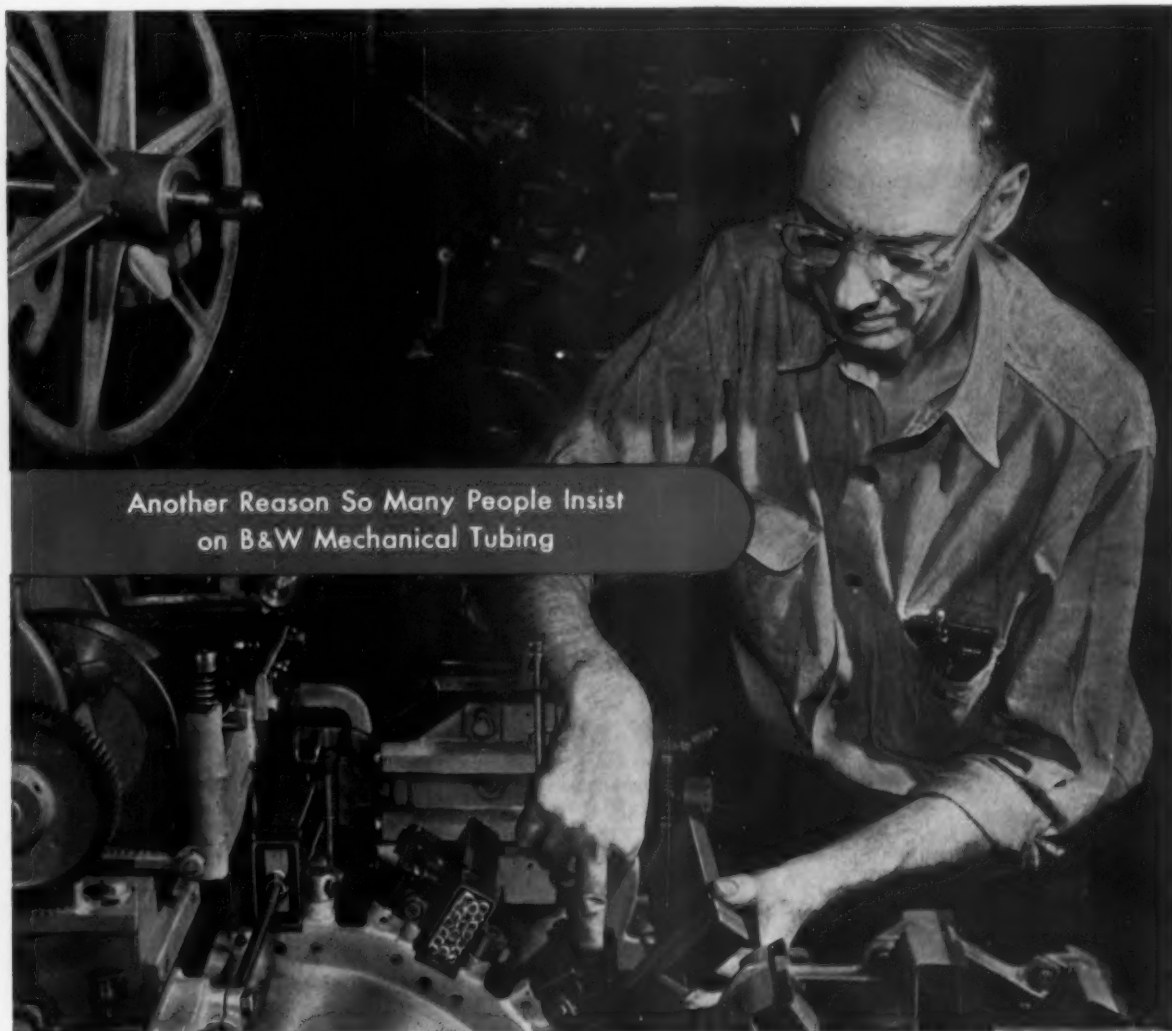
For complete information, see your Sun representative or write **SUN OIL COMPANY**, Philadelphia 3, Pa., Dept. GI-2.



INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY, PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL



Another Reason So Many People Insist
on B&W Mechanical Tubing

SNUG ARBOR "PUTS THE SQUEEZE" ON CIGARETTES

Smoking pleasure, represented by Vice-roys, Kools and Raleighs, is packaged faster than the eye can follow—7500 packs per machine per hour—at the Brown & Williamson Tobacco Co. plant in Louisville, Kentucky.

Heart of the unique packaging machine is the thin metal cigarette arbor, slightly narrower but longer than a cigarette package, perfectly smooth inside and out; strong enough to maintain its shape in use. Cigarettes, pushed through the arbor into the paper pack, expand slightly to make the tight, crisp package so familiar to smokers. Carbon steel arbors, previously used, required considerable time and labor to prevent rust, corrosion and splitting before and during fabrication.

In 1953, Brown & Williamson called in The Babcock & Wilcox Company whose tubing specialists studied the problems and suggested the use of B&W Croloy 18-8S, Type 304, Stainless Steel Mechanical Tubing, supplied in rectangular shape to Brown & Williamson specifications. Rust, corrosion and splitting during fabrication have been eliminated with estimated savings of 15 per cent.

You can "put the squeeze" on your operating time and costs by starting with the *right* B&W Mechanical Tubing—carbon, alloy or stainless—for your requirements. Mr. Tubes, your link to B&W, is ready, willing and able to give you the benefit of his long experience. Or write for Bulletin TB-361. 1A.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

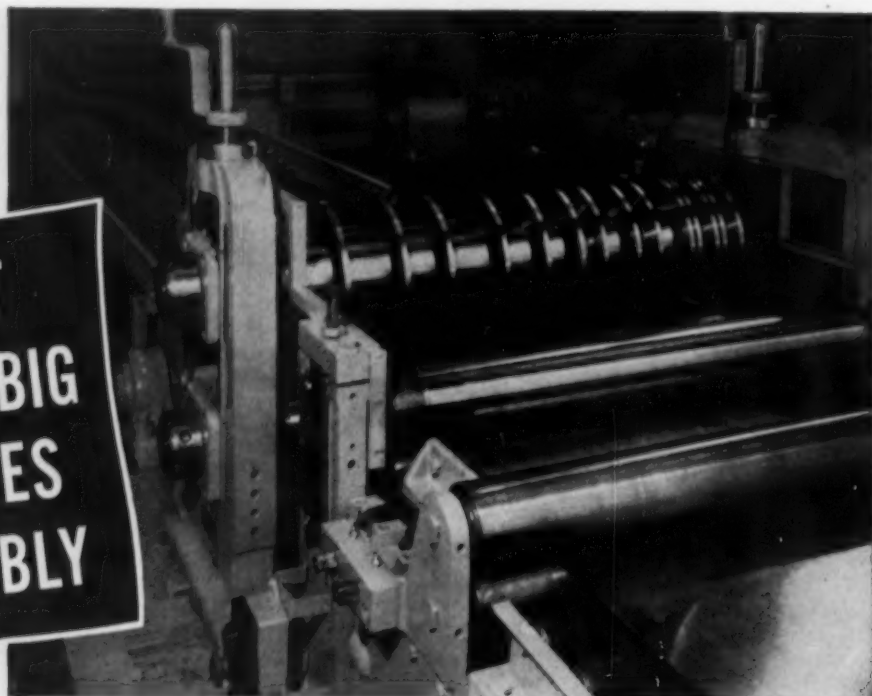
General Offices: Beaver Falls, Pennsylvania

Plants and Products

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Allentown, Ohio—Welded Carbon Steel Tubing
Milwaukee, Wis.—Seamless Tubing; Welded Stainless
Steel Tubing; Seamless Welding Fittings

TA-5043M

**TO SLIT
SMALL or BIG
TONNAGES
PROFITABLY**



Profitable slitting of *big tonnages* is assured with Yoder slitting line units engineered for big coil sizes, with gauges and speeds to suit the needs of rolling mills and other big producers and users of flat rolled metal. Many such Yoder lines have paid for themselves in a few months, and proved exceedingly profitable over the years.

For *smaller tonnages*, Yoder has standardized a series of slitter units and made them available at such moderate cost that their operation is *profitable on monthly requirements as low as 100 tons and even less.*

Because of the great convenience, in addition

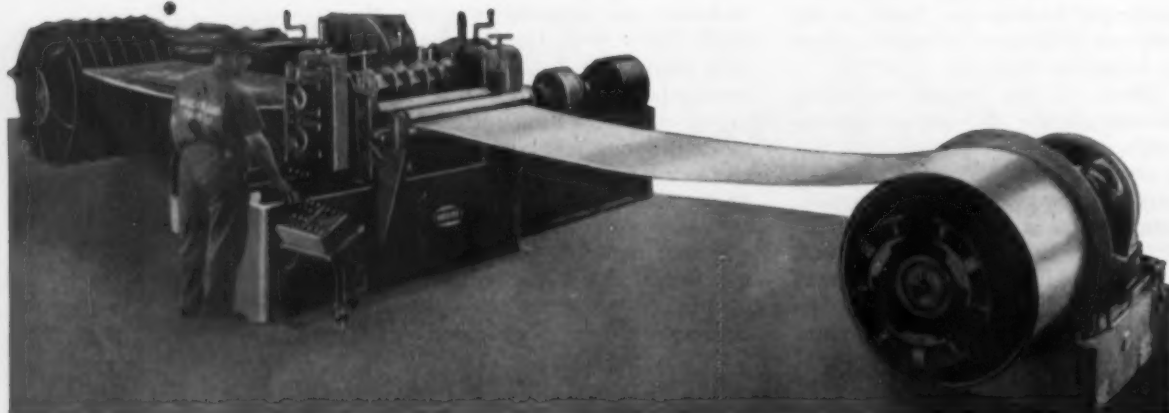
to the economy, of being able at all times to supply their own requirements in slit strands, to meet expected or unexpected needs, a host of metal fabricators in recent years have installed these Yoder slitters, and the number is growing insistently.

The YODER SLITTER BOOK contains production records, time studies and much other useful data on the mechanics as well as the economics of slitter operations. A copy is yours for the asking.

THE YODER COMPANY

5510 Walworth Ave. • Cleveland 2, Ohio

**SLITTING LINES • ELECTRIC WELD TUBE MILLS
COLD ROLL FORMING PRODUCTION LINES**



NEW!

TUMBLEX "N" Abrasive



PROCESSED BY NATURE and offered exclusively by Norton, the new Tumblex "N" Abrasive comes in sizes ranging from 3/16" by 3/8" to 1 5/8" by 2 1/2".

A natural for better barrel-finishing

*Latest tumbling abrasive — natural flint stone — offers new
"TOUCH of GOLD" benefits — brings finish up and costs down*

Tumblex "N" Abrasive is Nature's own tumbling abrasive. Carefully selected and graded by Norton, it opens up new possibilities for barrel-finishing applications such as light deburring, breaking sharp edges, polishing and burnishing and other operations where little actual cut is required.

Tumblex "N" has proved particularly valuable in bringing out the most desirable color of the finished part. Metals on which it has proved its ability to give an excellent finish include zinc, brass, copper, aluminum and various forms of steel, including stainless.

Its rounded, uniform shape and very low breakdown ratio prevent wedging, permit longer cycles and reduce the need of rescreening.

Another big Tumblex "N" advantage is extremely uniform cutting action. This assures the same uniform finishing in load after load. Also, it enables close

regulation of cut; for example, by adding measured quantities of loose abrasive grain to Tumblex "N" you can speed up the rate of cut with little effect on the life of this natural abrasive. Exact formulas for best results in job or production tumbling are easily worked out.

Norton customers who have tested Tumblex "N" Abrasive report:

- "Very good luster with no noticeable wear."
- "Fine performance. Very little breakdown. Reordering 700 pounds of sizes 2 1/4" T and 3 1/2" T."
- "Color O.K. on both zinc and brass."
- "Very long life. Gave excellent color on stainless steel."
- "A good polishing stone on aluminum."

Send Your Work Samples

Let us demonstrate in our newly enlarged Sample Processing Department how Tumblex "N" Abrasive can give the

value-adding "Touch of Gold" to your product quality and cut your barrel-finishing time and costs. NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

G-297



*Making better products...
to make your products better*

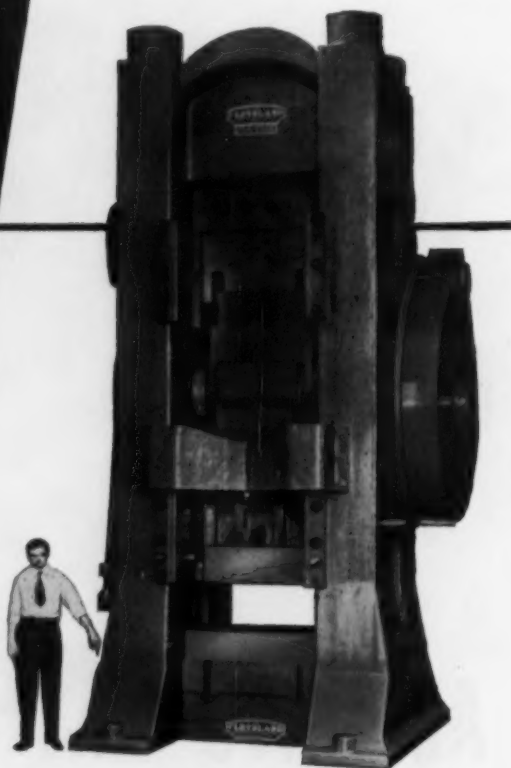
NORTON COMPANY
Abrasives • Grinding Wheels
Grinding Machines • Refractories
BEHR-MANNING DIVISION
Coated Abrasives • Sharpening Stones
Pressure-Sensitive Tapes

250 TONS OR 2500 TONS

Large or small ...
your stampings cost less
with a
CLEVELAND PRESS!



Cleveland S1-250-36-42 Straight Sided
Single Point Press 250 tons capacity



Cleveland 25K Knuckle Joint Press 2500 tons capacity

Each of the 11 specialized types of Cleveland Presses is made in a wide range of sizes.

You're sure of getting the exact press to give you utmost production economy.

The construction of all Clevelands is simple and powerful featuring ease of adjustment, minimum wear of moving parts, economy of operation and production accuracy.

You'll find that our patented Cleveland Clutch minimizes costly down-time. It gives you positive, fast control of the slide during all phases of operation. This reduces stamping rejects. What's more its light-weight design requires less horsepower for operation.

Extremely long slide bearing surfaces and rugged frame construction eliminate slide deflection even under maximum load.

These important Cleveland features assure you of lower unit stamping costs. Before you buy your next press won't you let us give you the complete Cleveland story? Just write or call today!

THE
CLEVELAND
PUNCH & SHEAR WORKS CO.

Established 1880

POWER PRESSES

FABRICATING TOOLS

E. 40TH & ST. CLAIR AVENUE • CLEVELAND 14, OHIO

Offices at: NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING
CITY FOUNDRY DIVISION • SMALL TOOL DEPARTMENT



**If it's really
"just as good..."
it's got to be
Gargoyle D.T.E.**



When you're offered substitutes for Gargoyle D.T.E. oils, remember these facts...



Socony Mobil
Correct Lubrication
FIRST STEP IN CUTTING COSTS

We're always pleased to hear someone say *his* oil is "just as good as Gargoyle D.T.E." It's an admission of an industry-accepted fact... Gargoyle D.T.E. hydraulic oils are the *standard of performance* in this field!

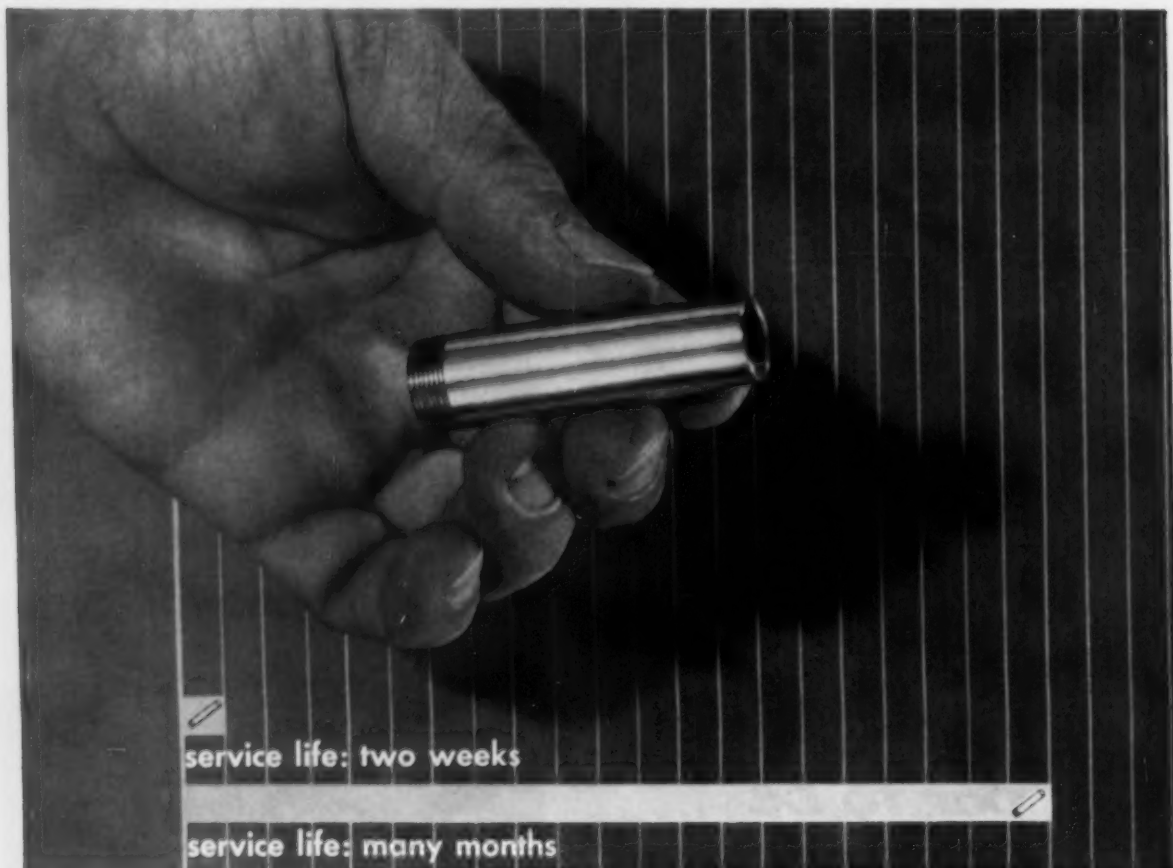
The quality of Gargoyle D.T.E. hydraulic oils is so uniformly high—their performance so dependable—that in hundreds of machines they have given thousands of hours of trouble-free service! This is why they also improve machine production—help reduce manufacturing costs.

Yet, with all these benefits, Gargoyle D.T.E. hydraulic oils cost less than *one-half cent* per machine per hour in hundreds of systems. And when you include the lubrication engineering service that goes with them—the world's greatest—you can see why these famous oils actually save you money in the long run.

So don't accept anything less than Gargoyle D.T.E. oil. It's the *only* oil that's *really* "just as good" as they say!

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION
Formerly Socony-Vacuum Oil Company, Inc.

Carpenter ...pioneers in specially-engineered steels through continuing research



HOW FAR CAN YOU GO

in reducing replacements of critical parts?

Every two weeks chrome-nickel stainless nozzles in a battery-filling machine corroded so badly from hot sulphuric acid that they had to be replaced. Hard rubber nozzles failed even quicker. Replacement time ran as high as 30 minutes. Here was a real opportunity for improvement . . . and the manufacturer met the challenge.

He called in the specialists who developed industry's first sulphuric acid-resisting stainless in rolled form. This unique Carpenter Super Alloy was a natural. After many months of continuous use, the new nozzles show no signs of corrosion. Eliminating frequent shut-downs has boosted battery production and reduced costs substantially.

Isn't there a place in your company for Carpenter men to work with you toward improved products and easier, more economical production? A wide range of

quality steels for virtually any critical application are backed by able and conscientious people who want to do business with you.

The opportunity is here. You can initiate this forward step in your plant by sending for a copy of Carpenter's 32-page book, "Service on Specialty Steels." The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

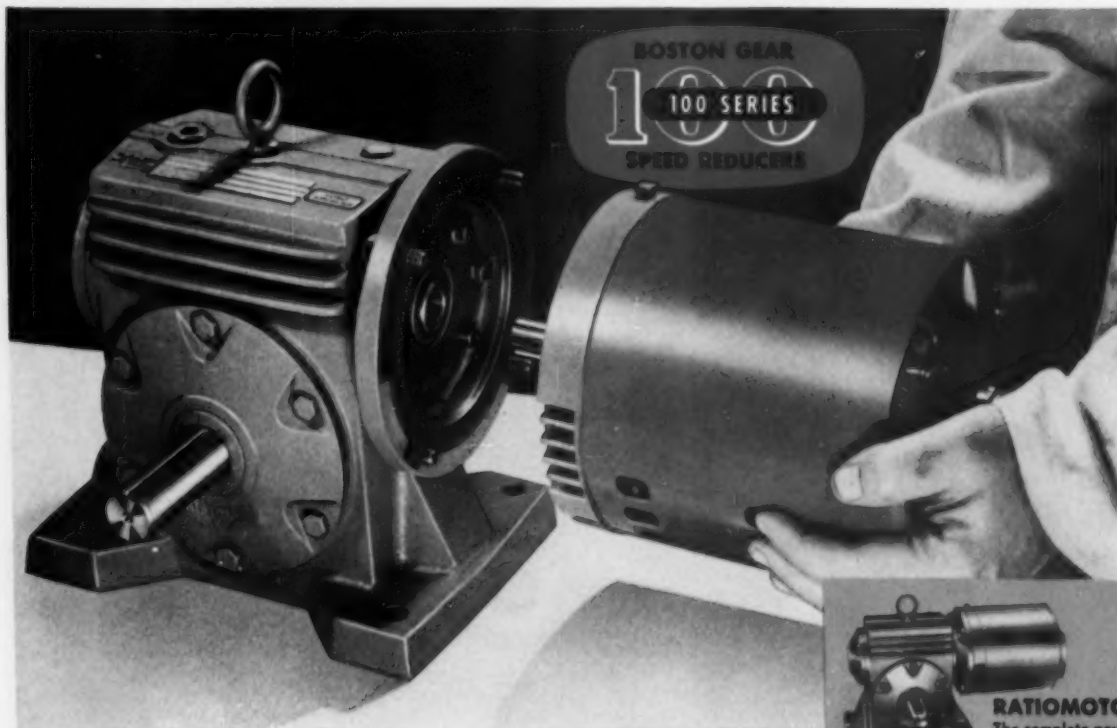
Are you taking advantage of these specially-engineered steels as made by Carpenter?

Matched Tool and Die Steels / Stainless Steels / Special Purpose Alloy Steels / Silicon and High Nickel Alloys / Valve, Heat-Resisting and Super Alloy Steels / Tubing and Pipe / Fine Wire Specialties

Carpenter **STEEL**

for product improvement





New COST-**SAVING** "COMBINATION" for certified efficiency—easy maintenance —and unlimited adaptability

The new 100 SERIES RATIOMOTOR combines a gear reduction unit and an easily detachable, standard end-mounted motor.

MOTOR CAN BE REMOVED and replaced in a few minutes, without disturbing the gear reduction unit. Saves maintenance time, preserves alignment, permits continued operation with spare motor.

ORIGINAL MOTOR CAN BE CHANGED When conditions require change to a motor of special characteristics (totally enclosed, explosion-proof, etc.) it can easily be attached in place of the original motor.

ANY MODEL NEEDED — FROM STOCK The 100 SERIES includes 1064 different *standardized stock* units for an unlimited range of applications . . . Reducers, for mechanical drives, as well as Ratiomotors and Flanged Reducers. All ratings are *certified* to be actual torque delivered, by Independent Laboratory tests.

A BOSTON GEAR FIELD ENGINEER will help you simplify planning, and put your product ahead in design. Your Boston Gear Distributor will arrange a call, or write: Boston Gear Works, 72 Hayward St., Quincy 71, Mass.

GET NEW CATALOG R-56

Lists models for any drive . . . horizontal or vertical—right angle or parallel—single or double reduction. Includes selection charts, engineering data.



**1064 DIFFERENT UNITS
108 MODELS — FROM STOCK**

Call your **BOSTON Gear**
DISTRIBUTOR

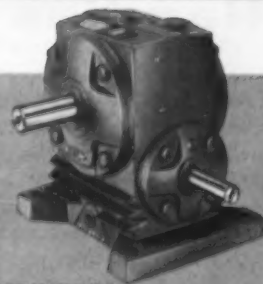


RATIOMOTORS
The complete power package, with motor.

SOLD WITH OR WITHOUT MOTOR

FLANGED REDUCERS

The Ratiomotor gear unit, supplied without motor. You buy and attach any motor you choose.



REDUCERS

For mechanical drives, new 100 SERIES design saves space and weight. Housings are finned for improved cooling. Fan-cooling optional on larger sizes.

**MAXIMUM HORSEPOWER
PER DOLLAR**

Certified

by Independent Laboratory tests

PATENTS PENDING

For nearest distributor, look under "GEARS" in the Yellow Section of your Telephone Directory.

55-BG-R-17A



Handles Hot Loads At Cool Savings

Hundreds of installations—in different industries, under various conditions, in every section of the country—have proved beyond question that Kaloric-Type 890 is the best heat-resistant conveyor belt on the market. It is specially engineered to handle hot materials—very hot materials, even up to 350°. Under favorable conditions it will withstand much *higher temperatures!*

Among the hot substances successfully conveyed by this unusual belt are: coke, limestone, cement, fertilizer, sintering, ores, slag, fuller's earth, char, foundry shakeout sand, sugar crystals, soda ash, chemically processed oxide,

refractory mix, glass, asphalt and talc.

All Kaloric-Type 890 belts are made with a special Neoprene compound that gives the best heat resistance. They are available in three carcass constructions: for temperatures up to 250°F., multiple plies of cotton duck; for temperatures above 250°F., plies of a special cotton and glass fiber duck. These are woven with cotton in one direction and fiber glass in the other, and each ply reversed in direction of glass and cotton. Skim coats are applied between plies for insulation and extra flex-life. Extra heavy top covers of special heat resisting compound ($\frac{1}{4}$ " to $\frac{5}{16}$ " are not

unusual) resist temperatures that would cause ordinary belt covers to harden and crack.

Kaloric-Type 890 belts are available in widths up to 72", any length, two to ten plies, with cover thickness to suit any conditions.

We also manufacture a complete line of industrial rubber products: belting, hose, packing and moulded rubber of every need. *Through your Quaker and Quaker Pioneer distributor* our research and engineering services are available to help you solve any industrial rubber problem. *Write for free folder and name of nearest distributor.*

DIVISION OF

HKP

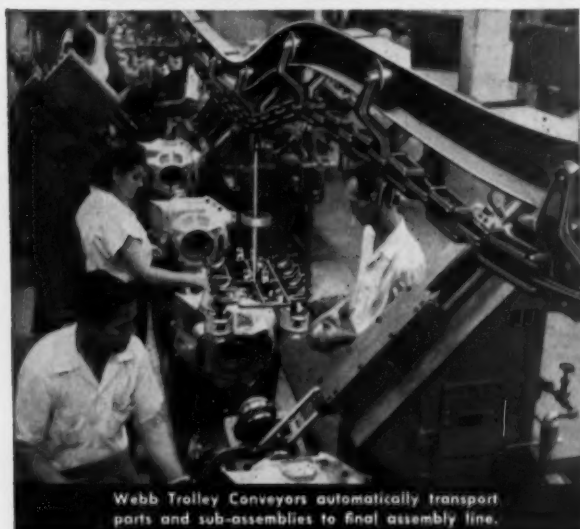
H. K. PORTER COMPANY, INC.

QUAKER RUBBER CORPORATION
Philadelphia 24, Pennsylvania

QUAKER PIONEER RUBBER MILLS
San Francisco 7, California

JERVIS B. WEBB

CONVEYOR ENGINEERING, MANUFACTURE, INSTALLATION and AUTOMATION



Webb Trolley Conveyors automatically transport parts and sub-assemblies to final assembly line.

Automation at Plymouth



Four miles of Webb Trolley type overhead transport conveyors have given the new Plymouth engine plant a higher degree of efficiency than they have ever had before. In engineering the layout for the new plant, Plymouth's goal was to achieve flexible and continuous production flow with a minimum of manual handling. Webb custom-engineered conveyor systems... 26 conveyor lines... have provided the answers for Plymouth.

Of particular interest is the high degree of automation designed by Webb engineers into the engine block production line. A Webb two-strand indexing type chain conveyor provides positive flow control for engine block production. Also, Webb engineers designed twenty rollover stations where engine blocks

Write to us on your company letterhead and we will be happy to place your name on the Webb mailing list to receive factual technical information on conveyor installations, case history reports, and new product literature.

MATERIALS HANDLING...



42 rollover and turntable stations, designed by Webb, index blocks 90° or 180° for machining operations.

are automatically rotated 90° or 180° on the vertical axis to put them into position for the next machining operation. In addition, twenty-two Webb designed turntables index the blocks 90° on the horizontal axis for another machining operation.

Complicated automatic control systems and the control panels were designed and built by Control Engineering Co., a subsidiary of Jervis B. Webb Co. These control panels furnish a visual check on material flow and the operation of the conveyor systems.

This installation is another example of how manufacturers are turning to Webb conveyor engineers for answers to their materials handling problems. Regardless of your needs—single line conveyor or a complete plant conveyor system—Webb engineering service will provide the economical and efficient answer to your materials handling requirements.

JERVIS B. WEBB CO.

Specialists in Custom Conveyor Systems

8931 ALPINE AVENUE • DETROIT 4, MICHIGAN

Offices and Representatives Throughout The World • FACTORIES: Detroit • Los Angeles • Hamilton, Canada

November 17, 1955



**More than
400
CECO-DROPS
(to be exact, 410)
in service
and being built
for 119 shops
all over
the world**

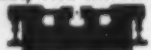
The piston-lift gravity drop hammer with short stroke control

CHAMBERSBURG

THE HAMMER BUILDERS

CHAMBERSBURG ENGINEERING CO.

Builders of THE IMPACTER



"FORGING IN MID-AIR"

CHAMBERSBURG, PENNSYLVANIA



ALL BUSINESS

Smart business, too, these Farrel® herringbone gears. That *bonus backbone*, formed by the meeting of the two helices without a center groove, puts the *entire* face width of the gear to work for you. Pays off in extra strength and greater load and shock capacity—perfect for heavy-duty applications.

Long-life precision is another feature. Benefits include quiet oper-

ation and increased efficiency. Ask for details.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Pittsburgh, Detroit, Chicago, Memphis, Minneapolis, Fayetteville (N.C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

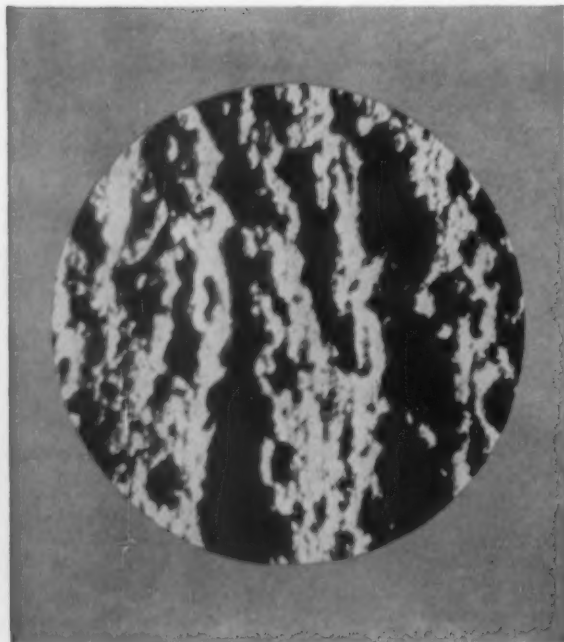
FB-1023

Farrel-Birmingham®

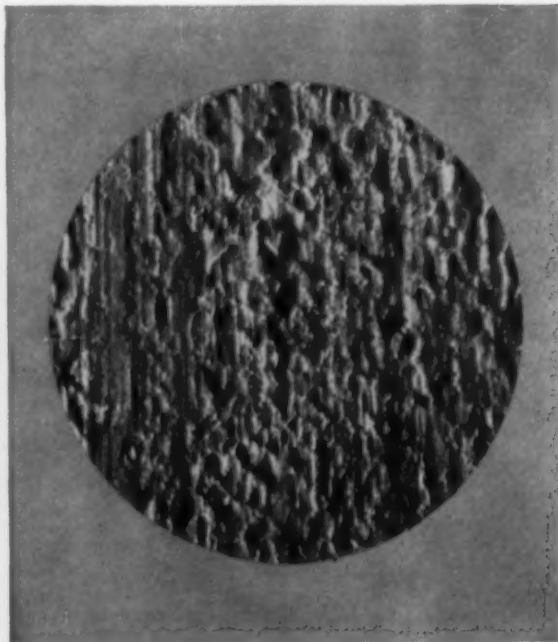
HOW RODINE CUTS PICKLING COSTS

Results demonstrate the effectiveness of Rodine® in retarding the attack of acid on the metal

Rodine pickling acid inhibitors, when added in small quantities to acid pickling baths, retard the attack of the acid on the metal without affecting its ability to remove scale. Their effectiveness in saving acid and metal is best demonstrated by this simple comparison.



Effect of Uninhibited Acid on Steel This microphotograph shows a piece of steel which was pickled in an uninhibited acid for 5 hours. Note the deep pits and the crystalline character of the surface of the metal.



Effect of Rodine Inhibited Acid on Steel This steel was pickled exactly like the other piece, but with Rodine added to the acid solution. Only scale pockets and roll marks are visible; no pitting occurred.



A typical strip pickling installation. Rodine prevents overpickling even during line shutdowns.

In straight line pickling of wire, rod and tubing, Rodine makes available more metal for drawing. In batch pickling, Rodine improves the surface. In continuous strip pickling, Rodine prevents overpickling during line shutdowns. Wherever it is used, Rodine saves acid and metal. Our treatise on pickling and the use of Rodine, "Efficient Pickling with Rodine," gives full information. Write for your copy today.

AMERICAN CHEMICAL PAINT COMPANY
Ambler 20, Pa.

DETROIT, MICHIGAN • NILES, CALIFORNIA
WINDSOR, ONTARIO



clip this advertisement

—give it to the man
in charge of wire handling
at your plant



**USS AMERICAN
MANUFACTURERS
WIRE**

Steel wire is one of the trickiest of all materials to handle and store. In fact, this has been a constant problem in our own plants for more than half a century.

So pass this offer along to the man in your plant responsible for the care and handling of wire: American Steel & Wire will be glad to visit your plant and recommend procedures that will save time and money, and lower the blood pressure of the people who have this very tough assignment.

We will also be glad to bring you up to date on the latest industry standards, so you can be sure you are ordering wire in the most economical manner.

Just call your AS&W representative. Tell him you saw this advertisement and want the promised help.

See "THE UNITED STATES STEEL HOUR"

—Televised alternate weeks—Consult your newspaper for time and station.

AMERICAN MANUFACTURERS WIRE

AMERFINE—High quality fine wire.

AMERSPRING—music steel spring wire.

AMERLOY—alloy heading wire.

AMERTEMP—heavy-duty oil-tempered wire.

AMERHEAD—uniform heading wire.

AMERSTITCH—extra-tough metal stitching wire.



AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

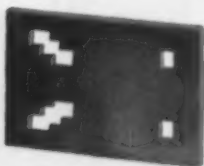
UNITED STATES STEEL

November 17, 1955

65



FLAME-CUT



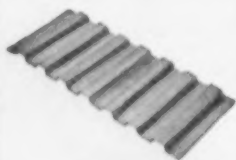
SHEARED



BLANKED



PRESSED



BENT

LUKENS



How much is it costing you?

STEEL PLATE SHAPES SERVICE CAN HELP YOU CUT SCRAP, INVENTORY AND FREIGHT COSTS

If you're searching for ways to pare production costs, look at pre-formed parts. Savings of 5% to 25% are possible when you buy components already shaped from rolled carbon, alloy or clad steel plate.

With By-Products Steel Co.'s Steel Plate Shapes Service, you pay freight only on material you will use. Plate inventories can be reduced and scrap problems virtually eliminated, saving both dollars and space.

Equipment builders find consistent savings right down the line with pre-formed parts. A wide range of finishes, from as-formed to finish-machined, saves production steps. No costly pat-

terns are needed; Steel Plate Shapes Service works directly from blueprints. Over 150 major machines are available to flame-cut, shear, bend, blank or press your parts.

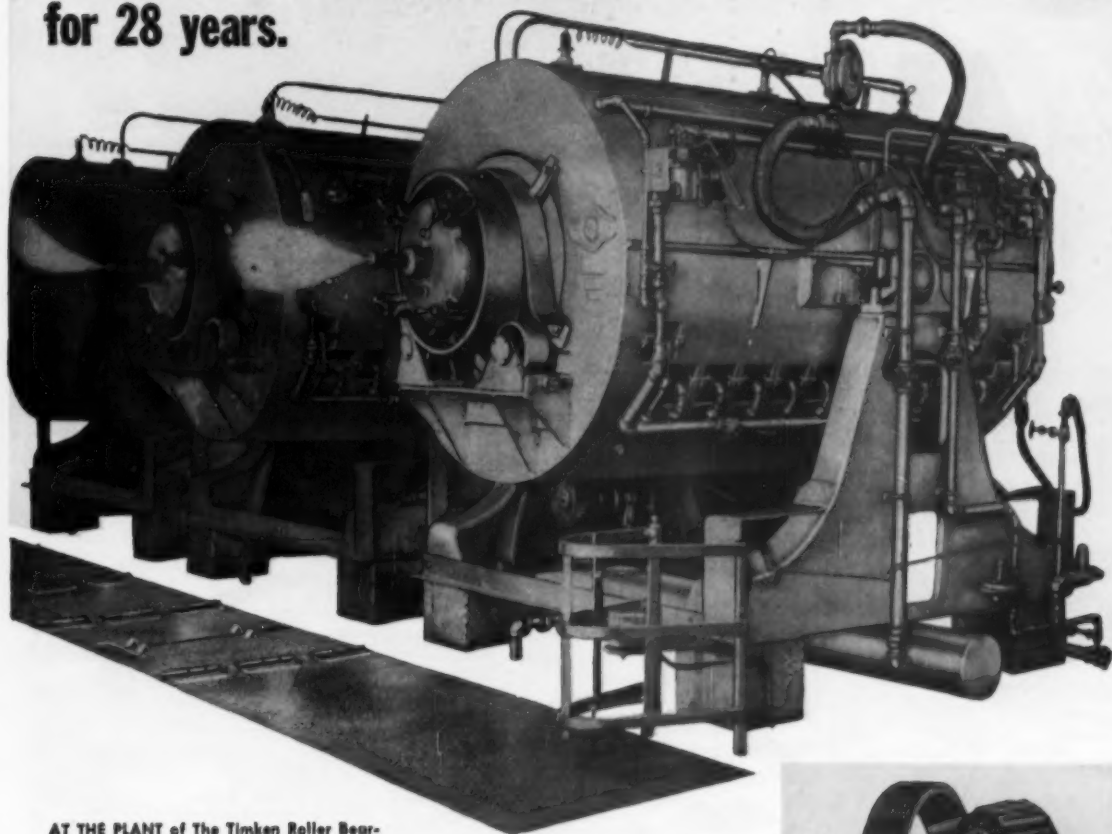
Located next to the mills of the world's leading producer of specialty steel plate, we can work from plates up to 195" wide or 25" thick, form and heat treat them to your specifications. If you wish to find out how you can use this unique service to cut your production costs, write on your letterhead for Bulletin 712. Address: By-Products Steel Company, 741 Strode Avenue, Coatesville, Pennsylvania.

STEEL PLATE SHAPES SERVICE

BY-PRODUCTS STEEL CO.

A Division of Lukens Steel Company, Coatesville, Pennsylvania

AGF ROTARY RETORT CARBURIZERS have been used for heat treating TIMKEN ROLLER BEARINGS for 28 years.



AT THE PLANT of The Timken Roller Bearing Company in Canton, Ohio, more than 22 of these AGF Model No. 4 Rotary Retort Carburizers have been purchased over a period of years for carburizing rollers and races of roller bearings.

Each furnace is capable of receiving loads of 1000 to 1300 pounds depending upon the size and shape of the work. A cold charge is raised to carburizing temperature within $1\frac{1}{2}$ to 2 hours from the time it is introduced and, of course, the carburizing cycle is maintained at temperatures up to 1700° , depending upon the case depth required. Deep quenching tanks are located in front of the machines for end of cycle quenching.

MANY ADVANTAGES. Since 1925, TIMKEN has used AGF Rotary Carburizers. The ones shown were photographed after 9 or 10 years of operation. They are easy to maintain, convenient to use and have innumerable exclusive features.

Most important in carburizing rollers for roller bearings, the constant rotation of the work in the rotating retort leaves no possibility of variations in case. "Point of contact" carburizing case variations are entirely eliminated by this positive method. Three separate control zones assure uniform temperatures throughout the work space.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

TIMKEN Roller Bearing quality is known throughout the world and American Gas Furnace Co. is proud to have furnished some of the production equipment that helped establish and maintain that quality. AGF has furnished TIMKEN more than 100 heat treating and carburizing furnaces.



For 76 years AGF has PIONEERED in the invention, development and manufacture of industrial gas equipment for heat treating and other processes. Submit your problems to AGF metallurgists and engineers. WRITE for New Catalog. NOW.

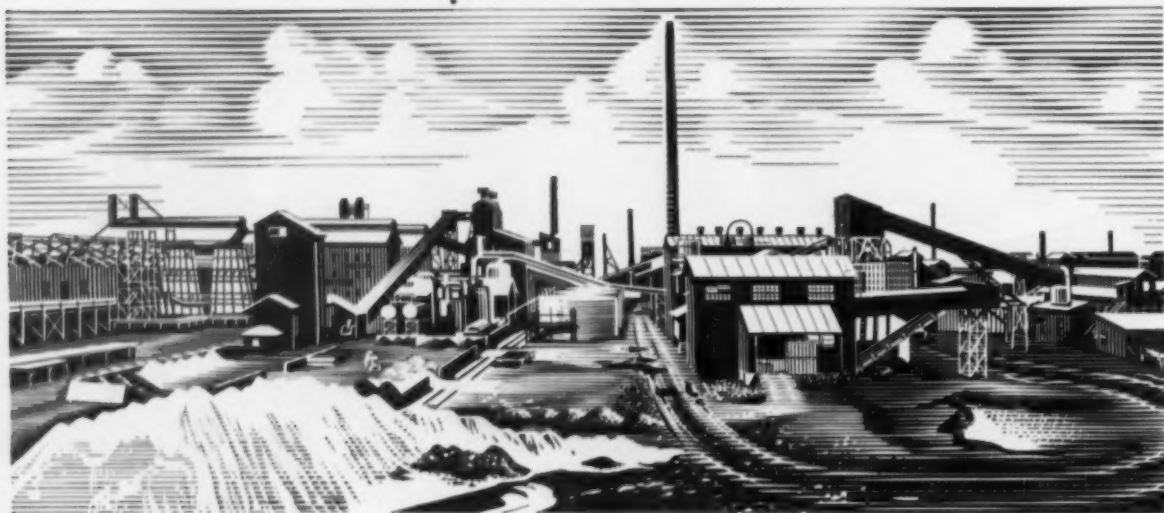


AMERICAN GAS FURNACE CO.

1004 LAFAYETTE STREET — ELIZABETH 4, N. J.

American
Zinc and its products

from **A**
to **Z**



FAIRMONT CITY, ILLINOIS
(East St. Louis)

Operations include: roasting and sintering of zinc concentrates; cadmium plant producing commercial balls, sticks and plates; zinc carbonate plant; germanium plant producing germanium dioxide for the electronics industry. Sulphuric acid is produced by both the Chamber and Contact methods. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

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Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

The Iron Age Newsfront

Fast Machining Creates New Problems

Already difficult chip disposal problems are getting even more complicated with faster machining rates. Task is not so much that of moving chips from the plant as it is in getting them off and away from the machine tool itself. Benefits of a new high-speed lathe at one plant were reduced by the need to shut down the machine one hour out of every eight for chip removal.

Trimmed-Down Bolts Improve Loading

Greater impact strength and resistance to fatigue failure is reported for structural bolts that have had a precise, optimum amount of metal removed from their shanks. Diameter of the threaded section is unaffected; all metal is removed from between the head and threads. Ability of the bolts to absorb shock loads is said to be increased several times over that of ordinary bolts.

Tighter Consumer Credit May Be On Way

The Federal Reserve Board is sitting on the edge of its collective seat, ready to spring if credit restrictions need tightening. This may be done by open market operation or raising the discount rate if Christmas spending should seem to depend too heavily on time payments. It will affect industry and business borrowing too, but not for long—just enough to nip holiday overspending. FRB was only one vote away from tightening up about a month ago.

Ultrasonics For Heat Treatment

Ultrasonics, once restricted to use in the inspection crib, has now demonstrated a new usefulness in the heat treatment of steel. The application of ultrasonic energy to a low carbon steel during polymorphic transformation from the austenite phase produces marked grain refinement. Similar application at high carbon levels results in grain coarsening.

Keep Eye On Finished Steel Items

Three products being watched closely by steel buyers give indications that they may be in

tighter supply than they are at present. In fact, cold-finished bars, large rounds and cold-rolled strip may be among the tightest items by the second quarter. This seems apparent in spite of all three being in better supply now than plate or cold-rolled sheet.

Contact-Type Electrodes Find New Field

Iron powder coated welding electrodes are about to invade the build-up and maintenance field for the first time. A major rod producer will soon introduce such an electrode which is said to have 35 to 45 pct higher deposition rates than conventional rods. It's intended for applications on building up gear teeth, bearing surfaces, power shovel dipper teeth and similar uses. Major features include reduced welding time, easy slag removal and little spatter. Deposited material will be machinable.

Experiment With Extruded Pipe

Extrusion may become the means of producing seamless wrought iron pipe. While production is a long way off, many wrought iron shapes, including hollow cross-sections, have been extruded experimentally. If practical, it will improve pipe strength; at the same time retain corrosion resistance.

Imports Bother Toymakers

A large eastern toy manufacturer introduced seven plastic-metal models this year—probably more in 1956. Thinking behind the move is to get away from growing foreign competition in all-plastic toys. This represents a definite trend toward the higher price market.

Shot Peening Reduces Car Weight

Informed metallurgists estimate that passenger car weights have been reduced several hundred pounds through the use of controlled shot peening. The gross weight of chassis springs, gears and shafts has been cut in half because of shot peening.

*"It couldn't
be done"...but*

SELAS GRADIATION HEATS DIE BLOCKS TO 1550°F...in 3¾ HOURS



**New Selas automatic heat processing method increases production rate 4½ times
... decreases fuel consumption 20% ... improves plant efficiency**

Reduction of a conventional 20 to 30 hour heating cycle to less than four hours ... with a corresponding increase in production rate ... has been achieved through use of a Selas Gradation furnace at the Heppenstall Company, Pittsburgh, where alloy steel die blocks, 8" to 24" thick, are heated to 1550°F. for hardening.

The completely automatic program-control heating method achieves reproducible uniformity in die block quality and assures that fast heating of large steel sections is practical and safe.

- The precision timing of the heating cycle permits close scheduling of quenching facilities and manpower, resulting in higher overall plant efficiency.
- Less labor (only about 20 minutes per heat) and less

highly skilled operators are needed ... to produce uniform results within each heat, and from heat to heat.

- Fuel consumption, per pound of steel heated, is reduced 20%.

The Selas gas-fired furnace, factory prefabricated, was in operation one week after delivery, eliminating six weeks of interruptions to plant operations customary with plant-site erection of other furnaces.

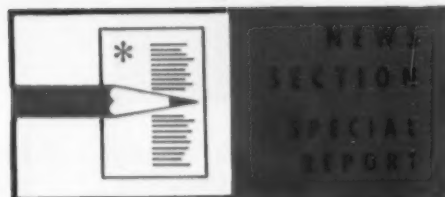
The benefits of Selas Gradation heating apply to small as well as large metal sections and include heat treating, brazing, forging, strip heating and many other continuous operations.

Write for descriptive data on Selas heat processing methods. Informative article describing the Heppenstall die block heating installation also available.



SELAS

**CORPORATION OF AMERICA
PHILADELPHIA 34, PENNA.**



Can Steel Avert a Scrap Crisis?

Only desperate measures by U. S. mills are keeping prices in line . . . Exports, capacity steelmaking, advent of winter conspire to keep scrap critical . . . Technical advances increase hot metal output.

♦ **HOW LONG** will steel producers be able to contain steel scrap prices? They've been doing a pretty fair job against stiff odds. But any number of things could upset their delicately-balanced defenses.

The coming winter will decide whether there will be another breakthrough on the scrap price front. Many consumers are shaky about their ability to hold the line. If the breaks go against them, prices could go right through the ceiling. No. 1 heavy melting, the bellwether grade, already is pushing \$50 in some IRON AGE districts.

Some scrap buyers already are hedging against a possible crisis by placing orders as much as three months in advance. Inventories may look comfortable today, but the situation could change overnight.

The Picture

Here's what the mills are up against:

(1) Prospects of near-capacity operations through first half '56, (2) a world scrap shortage that is draining domestic material to foreign consumers at a record-breaking clip, (3) slowdown of scrap flow during winter months, (4) possibility of an iron ore pinch next spring should weather delay opening of the Lake shipping season, and (5) wear and tear on blast furnaces, which have been bearing the brunt of the mills' offensive against higher scrap prices.

There's little or no chance of further restrictions on exports. In the first place, the steel companies

can't afford to press the issue for several reasons, including (1) vulnerability to a counter-attack on export of finished steel, and (2) the scrap is much-needed by friendly nations. For the last reason, both State and Defense departments oppose any roadblocks to scrap exports. Further, even the mills are divided on the issue.

Also working against the mills is the fact that announced expansion plans thus far include but one blast furnace. These may come later, but at \$30 million a throw for the furnace and related equipment, steel companies are inclined to think long and hard before they sign a contract.

At present there are no major blast furnaces under construction, and "less than a half dozen even

in the talking stage," according to one builder.

Price Relationship

Whether scrap prices are too high is beside the point. You can get arguments on both sides, depending on whether you talk to a mill or to a scrap broker. Scrap is one of the few products that moves up or down strictly on the basis of supply and demand—open market scrap, that is. And despite the best efforts of the mills, the price trend is up.

Several steel companies have included higher scrap prices among their reasons for raising finished steel prices. Lukens Steel Co. did it when it boosted carbon plate prices several weeks ago. Northeastern Steel Corp., a semi-inte-



STEEL producers are fighting hard to hold down the price of scrap. But their worst headaches will crop up during the coming winter. If the breaks go against them, scrap prices, already crowding \$50, will move upward.

Chicago Mill Gets Really Hot Metal

grated mill that depends entirely on scrap as a source of metallics, was squeezed to the point where it became necessary to apply an escalator clause to its base prices on hot-rolled carbon strip, plates, and flats. Prices will move up or down with fluctuations in THE IRON AGE price at Boston.

Dealer Side

But the scrap industry has its side of the story, too. Ed Barringer, executive vice-president of the Institute of Scrap Iron & Steel, has this to say:

"One important problem confronting the scrap industry is regaining markets lost to pig iron, home scrap, and industrial and railroad scrap. Consumption of purchased scrap is down 8 pct from the record year of 1951, while the mills have been making 12 pct more steel.

"In view of mill pressure for industrial and railroad scrap, the decline in demand for strictly obsolescent scrap from dealers is all the greater. Improved quality would help regain some lost tonnage, but the scrap industry is severely hampered by municipal regulations restricting the burning of automobile bodies. Only exports have enabled many dealers to continue in business."

Needless to say, the scrap industry favors an open export market. It also contends that scrap prices are relatively lower than pig iron and finished steel based on indices of the Bureau of Labor Statistics.

Mills Delay Buying

Apart from pushing blast furnaces to the limit, the mills have been living off inventories accumulated last year and early this year; and they have been relying more heavily on industrial and railroad scrap. Purchases of so-called dealer scrap have been timed to avoid upsetting the market.

One large Midwestern steel firm boasts that it has not bought a

◆ SOME 6000 lb of assorted mayhem went into the melt at Wisconsin Steel, Chicago steelmaking subsidiary of International Harvester, last week. Chicago police dumped weapons collected from prisoners in the past 18 months into a 175 ton heat of steel.

The unique scrap addition was made at the request of Chicago police, who've been hiring a tug, hauling the annual harvest of firearms five miles into Lake Michigan and dumping there. Cost per tug:

pound of dealer scrap all year. This mill laid in a heavy supply of heavy melting scrap last November when the going price in the district was about \$34 per ton. Current price is \$46. The mill also is using a 65 pct hot metal charge in its openhearth furnaces.

Another weapon used by the mills to minimize scrap consumption is direct charging of high grade ores into openhearth. Taconite pellets also are being charged into steelmaking furnaces to increase yield. Rich foreign ores are being used in the same manner.

The Pittsburgh market, which used to send shivers down the spines of scrap purchasing men, is not the trouble-maker it used to be. Prices there have been kept under relatively good control since U. S. Steel Corp. shut down its cold-charge melt shop at Vandergrift, Pa., and tore out about a million tons of marginal openhearth capacity at Homestead.

Exports Heavy

But heavy exports to Europe and Japan have tended to nullify the mills' efforts to hold the lid on scrap prices. Indications are that exports this year will mount to a record-breaking 4,552,084 tons. And there is no sign of a letup in 1956. European mills are short of scrap, pig iron, ore, and coal. There is little chance that this will change soon. Exports will be

about \$100 per hr. Total savings by disposing of the guns in an openhearth, about \$1000.

Chicago hoodlums had been relieved of four machineguns, 5000 daggers, brass knucks, blackjacks and razors, and 2500 small guns.

Police officers delivered the scrap to Wisconsin's charging boxes and unloaded it, at which point it went promptly into the openhearth.

Wisconsin paid a good rate for unprepared scrap—a \$100 donation to the Policemen's Benefit Fund.

as heavy as the U. S. Government will allow—and that will be heavier than the mills will want it to be. There has been no change in the viewpoint of State and Defense on shipment of scrap to our allies.

On the export side of the picture, it is frequently charged that shipments end up behind the Iron Curtain. However, as a strategic material, scrap exports require a special license from the Dept. of Commerce and cannot be obtained for shipments to Communist countries. There is no evidence of any quantities of scrap being transshipped.

Conversion Enters

Meanwhile, the pinch on steel supply has injected a new and threatening factor into the picture: conversion. The increase in conversion steel and the expansion in the number of mills charging premium prices means a greater scrap demand from sources that heretofore did not buy as much. Conversion is practically a cost plus operation, and premium prices support greater output at high cost mills.

Regular scrap buyers will now have to compete with mills which want to get that extra ton out of their steel plants or foundries. In a thin market—and we have had that for months—such competition will pressure the scrap price to a higher level.

♦ **DOMESTIC** scrap problems faced by U. S. steelmaking are underlined by a serious world wide scrap shortage resulting in a mounting demand for U. S. export scrap.

Exports of iron and steel scrap from the U. S. are expected to total about 4.5 million short tons this year, surpassing the record export year of 1937 when the prewar arms buildup was at its height.

The sudden upsurge of U. S. scrap exports marks a return of the prewar pattern when the U. S. was the leading scrap supplier to world steelmaking.

Postwar Decline

The decline of shipments from this country in the years after the war was caused in part by the decline in European and Japanese steelmaking. But more important, the wartime destruction left these areas a heritage of scrap from bombed and wrecked buildings and scrapped war materials.

Now these areas have recovered and their steelmaking facilities are running at near capacity. At the same time, the great tonnage of war scrap is gone and the demand for scrap is increasing every year.

Competition for world scrap will continue to increase as steelmaking increases. World steel production has risen from 134.4 million tons in 1938 to more than 246 million tons in 1954. The figure will be higher when 1955 expansion is recorded.

U. S. Leading Exporter

Before the war, U. S. supplied nearly two thirds of all scrap exports. In 1937, Japan was the largest importer of scrap, and shipments from the U. S., which went directly into its munitions buildup, are still controversial.

In the first six months of this year, the European Coal and Steel Community was the biggest buyer of U. S. scrap, taking 1,311,751 tons. The United Kingdom took 503,683 tons; Japan 230,095; Mexico 114,873; and Argentina 53,113 tons. Japan's imports mounted in the third quarter and continue to climb in the last months of the year.

SCRAP: World Shortage Looms

No easy solution to world scrap problem as U. S. exports climb to record . . . World steelmaking countries stress pig iron production in expansion programs—By F. H. Harley.

Government officials expect exports to run about 1.2 million tons a quarter through the first quarter of 1956, possibly higher if the trend to mounting shipments to Japan continues.

Japanese purchases have been instrumental in boosting the price of West Coast scrap and purchases for the Orient have extended to the Gulf Coast and even inland.

European experts are not cheered by what they see in the world scrap picture. They realize that imports from the U. S., the major world source, are close to the maximum. Both the United Kingdom and the ECSC have surveyed

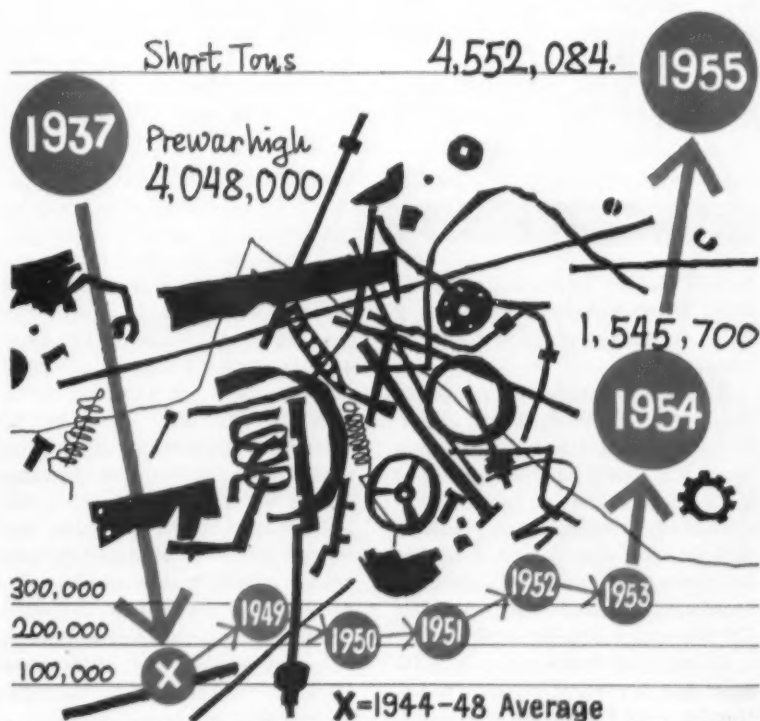
the situation, with little prospect of a short term solution.

Will Stay Tight

Britain expects to produce at least 24.6 million tons of steel by 1958, compared with 20.6 million in 1954. The British Iron and Steel Federation has made a survey of the world scrap situation to find out if there will be sufficient scrap to meet the demand.

Conclusion is that the position is safe, but that steelmakers will have to change methods to use more pig iron than has been the practice. Britain has aimed its entire new steel expansion toward reducing scrap consumption.

Ferrous Scrap Exports



MILL CRANES: Business Is Picking Up

Jumbo-class equipment makers hit healthy expansion programs after year's hiatus . . . One leading producer reports bookings well into '56 . . . Larger aluminum ingots mean bigger cranes—By T. M. Rohan.

♦ **THE LATEST SURGE** of steel industry expansion is finally starting to hit some of the behemoth-class equipment suppliers—after a year or more of marking time.

Morgan Engineering Co. of Alliance, O., steel mill crane builder, is handling its largest volume of inquiries since early Korean war days. Bookings are well into 1956 but there is plenty open shop time available in the industry.

Many items have up to one year lead time. Employment at Morgan, which generally follows about a 6 mo. lag on the upswing and let-down of the steel industry, will be over 1000 on three shifts daily by year's end from the low point of 650 late this summer. And long delivery dates, one of the unavoidable corollaries of this hot-and-cold business are being fast eliminated through expansion of facilities.

But like other equipment producers, steel mill equipment

makers are caught in the middle of the steel shortage, especially on two of the hardest to get items, plate and wide flange beams. A fortunate windfall, however, is that steelmakers will make delivery concessions to expedite equipment for their own mills.

Meanwhile, Morgan is showing off its latest step in a two year "do-it-yourself" expansion program—a 52 x 20 x 15 ft. ultra modern stress relieving furnace. In a brief ceremony in the plant's weld shop, W. H. Morgan, president, lit the first burner. Mr. Morgan said that the facility represented another major accomplishment in the Company's two year expansion program.

The unit costing approximately \$150,000 is the largest in the mid-west and one of the largest in the country. It will speed completion of major equipment and eliminate farming out of major components for stress relieving. A new boring, planing and drilling machine

is also on order to start operation late next year on finishing king-size fabrications.

A healthy part of the business from the latest surge of steel-making expansion will fall squarely in the willing laps of builders like Morgan.

Most mills are out to squeeze as much production from existing facilities as possible because of extremely high cost of new built-from-scratch facilities. Morgan finds, for example, many ladle cranes are being "beefed up" from 100 ton capacity to 175 tons or more for faster pouring. Others in the 200 ton class are being raised to 275 tons.

Cranes for aluminum plants are also getting bigger due to trend toward larger ingots. Cranes for handling 2-ton aluminum ingots must have wider guide frames, bigger tongs and other special designs to handle added bulk.

Many Foreign Inquiries

On Morgan's other major proprietary line of blooming and slabbing mills and complete auxiliary equipment, heavy inquiries are developing from foreign sources as well as in the U. S. A heavy percentage of inquiries is coming from Europe, principally in Germany, and from Central and South America.

The new stress relieving furnace was a long planned addition brought to a head by a major new subcontract for component parts up to 45 tons for a series of huge automotive stamping presses.

The obvious conclusion to be drawn from the expenditures which resulted in additional facilities so late in the boom year is confidence in further steel expansion despite lack of fast tax write-offs and continued business prosperity.

Ohio Defeat Fails SUB

♦ **SUPPLEMENTARY** Unemployment Benefits took a major body blow in last week's election in Ohio.

The CIO sponsored initiative petition there (IRON AGE, Oct. 27, pg. 37), which would have raised maximum benefits from \$33 to \$59 per week irrespective of other unemployment payments, was roundly defeated by the largest plurality ever recorded in an Ohio election. Unofficial but final count was 870,755 for and 1,458,483 against.

To make SUB workable, the CIO must get favorable legislative action by June 1 in states where two-

thirds of the auto industry workers live. Michigan, with over half the employees, has approved by an administrative ruling of the attorney general's office. Other favorable rulings have been handed down in Delaware, New York and Massachusetts. But with the cause lost in Ohio, the whole plan is still in jeopardy. Indiana is the next target state. If it falls through there, it will take a combination of any two of Illinois, Missouri, California or New Jersey. Over 67 pct of Chrysler and Studebaker-Packard workers are in Michigan so they will get payments.

STEEL: Fast Tax Writeoff Is Out

Secretary Humphrey adamant on tax concessions for steel expansion
 ... But this won't delay expansion programs Neither will drop in business
 next year, if it comes . . . Steel prices a factor—By Tom Campbell.

♦ THERE WILL BE no reinstatement of the 5 year writeoff for steel expansion. Only thing to change this fact would be another Korean type war. That isn't in the cards for the near future.

Treasury Secretary Humphrey's antagonism to the fast writeoff is not due entirely to his effort to balance the budget. The basic view is that the steel industry is no longer entitled to a rapid amortization because of defense needs.

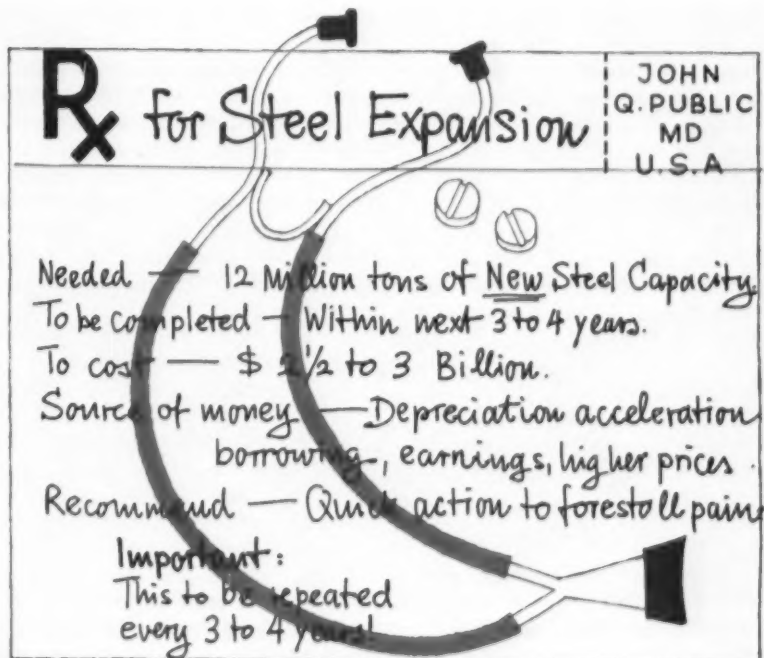
There have been reports that steel firms will not expand as much as they would have had they been eligible for rapid writeoffs. This is only partly true—if it is true at all. Such talk may be so much window dressing.

The steel industry will expand. The program will pick up speed after a few steel leaders are sure they can't change George Humphrey's mind. So far they have run up against a stone wall.

Steel industry leaders are notoriously conservative in assessing the size of expansion programs. This time is no exception. The current project is gaining momentum as each month goes by. There are three good reasons for this:

(1) There is a basic need for increased steel capacity. Customers are tired of hearing about "temporary" shortages. In the last analysis the buyer is the boss.

(2) Competition among steel men will not let any of them lie down on the job. Some steel firms already are stealing a march on others. Plans are being made to recoup customer losses—or the losses in customer esteem. No steel official worth his salt will allow his company to be behind the times. Plans not yet announced are being worked over and some already announced don't tell the



whole story.

(3) Time is awasting. Steel firms which don't get on the ball soon may find their expansion orders far behind on promised delivery. This expansion in steel capacity will mean more ore, more boats, more railroad cars, more limestone, more coke, more furnaces, more slabbing mills, more rolling mills, trucks, and more steel labor.

Steel Expansion Lags

Steel firms would go ahead on expansion plans even if a substantial drop in steel demand next year was a certainty—which it isn't. Such a drop would be temporary.

Judged by population figures and mass spending, the steel industry is behind the parade in steel capacity. The longer new projects are postponed the more trouble the steel industry faces

with its customers, and with the Government.

Is the talk about steel prices after the first of the year a trial balloon? Maybe yes and maybe no.

A steel price increase could carry with it inflation and political dynamite. But if steel firms don't sell new capital stock a big part of expansion costs must come from greater earnings, which would require higher steel prices.

It is a good bet that by the time the current 12 million ton expansion project is completed the country will need a brand new one. The 3 million ton a year requirement for the next 15 years is not a liberal estimate—if anything it is too conservative. Today's birth rate, today's spending habits and tomorrow's family formations may make shambles of today's steel plans.

WINTER: Look Out for Jack Frost

Don't wait until it's too late to check your plant's winter maintenance . . . Snow removal should be planned in advance . . . Gas supply may be cut short in extreme cold periods . . . Use own facilities.

◆ IS YOUR plant ready for winter?

If it isn't, or if you don't really know, it's time to make sure. Lack of preventive maintenance can be costly unless precautions are taken against the damaging effect of freezing weather and resulting snow and ice.

The most common and possibly the most costly problem is also the easiest to remedy. A heavy snow or piling up of snow in a freight area can prevent shipping out of finished products, account for valuable storage space, and have lasting repercussions by preventing incoming raw materials necessary for production from reaching the plant.

Easy Solutions

There are three solutions generally resorted to by industry, depending on size and location. Those with the maintenance man-

power usually prefer to purchase their own snow clearance equipment. Larger plants like the Fairless Works of U. S. Steel Corp. have extensive specialized equipment to keep railroad tracks and roads clear. For smaller companies with less imposing requirements, snow pushing blades are available to attach to industrial vehicles such as fork lift trucks, cars and light trucks.

Plants with small maintenance departments can have the snow removal problem taken care of by road building contractors. Since winter sees a virtual standstill in their activity, many of the contractors make their crews and heavy equipment available to industry.

The minute the first flake of snow falls, road crews go on 24-hour call. If you intend to hire a contractor, you had better get go-

ing. Most of the road builders have been in the snow clearance business for some time and will take care of old customers first.

For both of these techniques, the best bet for locating prospects is the classified telephone book. For equipment, look under snow plows and for a contractor, paving contractor.

Watch the Roof

It is possible to lease snow clearing equipment but this is generally more expensive.

And when you have cleared the freight yards, don't forget to look on the roof. Snow is deceptively heavy. Caved-in roofs are relatively common occurrences each winter.

Ice is not generally a problem since sand or salt can be spread to eliminate skidding. That is unless it is in pipe lines. In addition to halting the flow of necessary industrial liquids, the expanding liquid can rupture the lines. The easiest solution to this problem is salamanders or 50-gal drums of coke or slow-burning fuel placed close to the pipes at key locations.

Use Steam

Plants which have the use of steam can make use of this in many ways. Steel mills receiving frozen shipments of ore find this method the fastest and most efficient for thawing out the ore cars.

Plants located anywhere near a residential district, and using natural gas, may run into a crippling shortage during an extreme and prolonged cold spell, because of the increased demand from the private houses. Many of the U. S. Steel Pittsburgh plants maintain storage tanks of fuel oil to prevent loss of production time from the cause.

WINTER . . .

Can cost you money—lose production time—halt shipments—damage equipment—reduce valuable storage space

Insure Against It . . .

SNOW CLEARANCE

Your own equipment—Big modern and specialized, or push blades for lift trucks and light vehicles.

Contract clearance—Road builders will move in and keep you clear for the winter.

And don't forget roofs. A cave in will damage expensive machinery.

ICE

Watch the pipe line—50 gal drum of burning coke will keep it clear.

COLD

Prolonged cold snap can strain fuel reserves.

OIL COUNTRY: Things Happen Fast

Mills stocks of oil country goods seemed ample at start of the year . . . But well drilling picked up and the pipe pinch was on . . . Shortage slows some but no cutbacks . . . See big '56—By K. W. Bennett.

♦ A SALESMAN for oil country goods threw up his hands last week.

"That's a good customer I was just talking to," he said. "I just had to say I could give him one-third of the tonnage of N-80 tubing he needs."

Reported another: "We're turning away 30 pct of the orders for alloy tubing. We just can't get the stock."

Oil country tubing and casing is on the up elevator again, and there's no indication of a letup during first half 1956. Demand is rising, stocks are sinking, deliveries are slowing.

Demand Will Jump

Oil producers went into 1955 with huge stocks. As these dwindled, well drilling was stepped up. The year's total of U. S. oil well completions will be about 55,000.

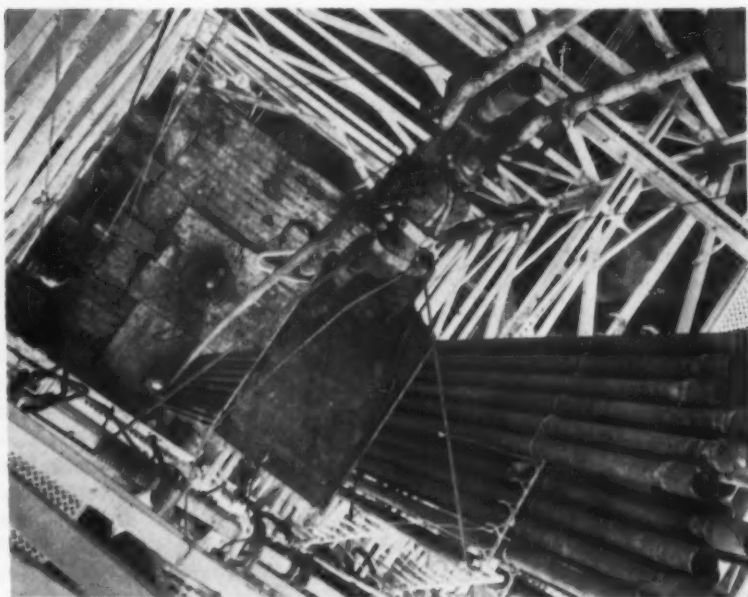
Next year, demand for petroleum products will go up at least 3.5 pct. With inventories down, still more wells will be needed. The industry estimates some 57,000 will be drilled in '56.

Steel Stocks Down

A similar situation has developed for producers of oil country steel. They entered 1955 with reasonable mill stocks of finished goods. In-transit shipping sites were fairly well equipped to handle local demand. Jobbers were carrying as much as 60 days' inventory (IRON AGE, Feb. 10, 1955, p. 54).

The industry will enter 1956 with virtually no stocks of casing and tubing and a severe and already growing shortage of high strength alloy steel tubing.

Demand varies with diameter and analysis but N-80 ordered now



BIRD'S EYE VIEW of deep well setup silhouettes linepipe stackup, rapidly growing shorter, as drillings lengthen. First half ample pipe stocks have dipped to dangerous levels. Next year's demand will be even heavier.

might not be available before July, if then.

Pressure tubing and some seamless tubing sizes in lower carbon steels extend through July of next year.

Some electricweld tubing has been delivered in as little as 30 days and in a popular diameter; but this varies with the mill and mill commitments may run out to 150 days, a common minimum delivery time for seamless tube.

Casing in 5.5 in. diam was reported 60 days behind specified delivery date in one case last week, with no indication of easing.

Large diameter seamless is very bad, with some producers of the 20 in. diam stock already specifying nothing better than early second quarter delivery.

Along with tubing itself, some

welding fittings fabricated from seamless tube are coming into short supply, particularly in 12 in. and larger diameters.

Worse To Come

Drillings have not been cut back at this stage for lack of casing and tubing.

Lack of steel is a real pinch already, will probably get worse through first quarter of next year. By that time even with the normal seasonal cutback in drilling operations during December-January, the oil country steel situation will be bad enough to curtail drilling operations.

Besides proving that oil country appetite for tubing and casing is still unsatisfied, 1955 proved that the number of rigs operating failed to show footage drilled.

COLOR EXTERIORS: Field With a Future

Use of color bearing metals in architecture snowballs . . . Growth potential tremendous . . . Architects spur demand . . . Porcelain enamel, anodized aluminum, glazed stainless steel—By F. J. Starin

♦ COLOR is the new frontier in architectural metals. Steel with a porcelain enamel finish, stainless steel with a newly developed color glaze process, and aluminum colored by dye applied during the anodizing or coated with porcelain enamel are among the leaders in the race to take advantage of this new market.

Both anodized aluminum and glazed stainless steel are new entries in the colored metal architectural field. Extensive research to overcome weathering and cost problems is being conducted in both products in a full scale attempt to develop the market.

Porcelain enamel registered 1953 sales in excess of \$25 million for building applications as compared with only \$1 million in 1940.

Because porcelain enameling on carbon steel antedates its competitors by quite a few years, it currently holds the edge in this increasingly profitable market.

At the last count, better than 80 completed buildings of major proportions made use of colored porcelain enamel in their construction.

New in this field is the use of porcelain enameled aluminum. It offers weight advantages, excellent workability and resistance to corrosion. Besides adding color, the coating increases the strength of the aluminum and its resistance to alkalis and thermal shock. However, it costs \$2.50 or more per sq ft (depending on the grade of metal) as compared to \$1.40 per sq ft for porcelain on steel.

Architects Responsible

The impetus for this trend in commercial building was supplied by the men behind the drawing boards.

Frank Lloyd Wright, controversial figure in American architecture, designed a green porcelain enamel-on-steel roof for a house on the west coast. Cost is prohibitive for general use. But it served to emphasize Mr. Wright's ideas on the increased use of color.

A pioneer of simplicity and clean lines in architecture, Ludwig Mies van der Rohe, the director of the department of architecture at Illinois Institute of Technology, specified the use of bronze in an attempt to incorporate color into the 38 story skyscraper he designed for Seagram.

In a survey, reported in August 1955 by the American Institute of Architects, 99 pct of over 750 architects questioned indicated they intended to use colored metal curtain wall panels of some type in many of their future projects.

Curtain Walls Main Use

The primary use found for color bearing metals by the architects have been in spandrels, veneers and curtain walls.

Spandrels are rectangular figures formed by moldings and usually feature color bearing metals on buildings with broad expanses of glass.

Veneer, a paneled covering hung on a supporting wall, is headed for widespread use. Stores, warehouses and industrial plants in smaller communities are making increased use of color bearing metal panels hung on old masonry to modernize their establishments.

A curtain wall is any exterior



RANGE of patterns and designs available for building exteriors has widened considerably with the more extensive use of color. Above are the results of experiments with a color glaze on stainless steel.

wall which does not bear a load. It usually consists of exterior and interior sections with insulation sandwiched between. It is in this application that most activity has been generated.

Use of a color glaze on stainless steel resulted from a two year study on metal curtain walls made by the Princeton School of Architecture for the Committee of Stainless Steel Producers of the American Iron and Steel Institute.

Because of the cost factor and the fact that stainless is decorative without a finish, the idea of applying color received a rather cool initial reception. However, when it became obvious that color was in increased demand, research came up with the glazing method, which is similar to porcelainizing. Color is applied so that the coating is translucent, permitting the metallic quality to dominate. Also, because of the natural corrosion resistance of stainless steel, color may be applied to only part of the surface in a pattern giving the architect more flexibility in creative designing.

Limited Colors

The highly limited range of colors which will stand up under prolonged natural weathering is the biggest stumbling block to increased use of architectural color anodized aluminum. Blue, gold, gray, black and brown constitute the entire line of exterior colors. However, both major aluminum companies are betting on the future of color anodized aluminum.

Alcoa has added facilities to color metals at the mill for both decorative and architectural functions. Reynolds recently put into operation a new \$2 million color anodizing line.

Among companies actively trying to develop better colors are E. I. du Pont de Nemours & Co., Wilmington, Del., and Stolle Corp., Sydney, Ohio, a leading independent fabricator of architectural aluminum.

Color anodizing process for exteriors is so new that no units yet exist that have stood prolonged weathering. Instruments like the weatherometer are being used to speed up weathering process in



EXPERIMENTATION on metal curtain walls is going on simultaneously with efforts to perfect color applications for this purpose. Bond between decorative face and rigid backing is being thoroughly investigated.

the laboratory. The du Pont Dyes and Chemicals Div. is concentrating on the current range of colors in an effort to improve their weatherability.

Stolle is working on widening the range of colors. Helmut Bengston, in charge of the project, declares that they consider this a long range problem, but one which they expect to solve. They are experimenting with protective lacquering and the use of ultra-violet rays to promote better color fastness.

Potential future customers are keeping their eyes on the Alcoa sales office building erected in 1954 in Cincinnati with gold and blue anodized aluminum, and the Alcoa building now being constructed in Atlanta, Ga., by the George A. Fuller Co. It has an anodized gold aluminum mesh.

Porcelain enameling consists of fusing a ceramic finish to carbon steel or aluminum by heat. Since the finish is ceramic it offers better corrosion resistance. The range of colors is extremely wide and color fastness is excellent. A modern technique of applying two colors in separate baking operations permits the architect to in-

corporate designs or two tone effects in his plans. However, the ceramic finish is more susceptible to chipping which can lead to corrosion of the base metal.

In 1951, porcelain producers appropriated \$50,000 to have an architect design an efficient porcelain enamel curtain wall. The result of the study was an improved unit, with greater rigidity, lighter and thinner.

Boom Arrives

When the color boom arrived architects made more extensive use of porcelain enamel curtain wall panels. Green panels were used in a floor-to-floor sash arrangement for a dormitory at Clemson College, Clemson, S. C. A building for the Ursuline School, Youngstown, Ohio, utilized double faced panels in two and three story sash. Other buildings on the color bandwagon with porcelain enamel paneled curtain walls are Fram Corp. building, E. Providence, R. I., blue and white; Mile High Center, Denver, light buff; Ford Central Staff building, Dearborn, Mich., blue-green; General Motors Technical Center near Detroit, gray-green and gray.

WIRE: Outlook Even Better For '56

Rod shipments expected to hit close to 5.2 million tons this year . . . Up 13 pct over 1954 . . . '56 output expected to be as good or better . . . Steel availability key—By D. G. Picinich.

♦ LOOKS LIKE another good year ahead for wire producers. Wire rod shipments this year will hit close to 5.2 million tons, about 13 pct better than last year's 4.6 million tons. Next year will be as good or better than '55.

The industry has few worries at the moment. Only note of pessimism is the feeling of some producers that sales will drop by 15 pct in fourth quarter of '56. First three quarters look safe.

This optimistic outlook is predicated on availability of steel. Wire competes with other products for a share of raw steel.

Low-price imports are one of the industry's headaches, especially in products where there's a high labor factor, such as nails. Foreign im-

ports now reach inland as far as Tennessee in the East, are particularly heavy on the West Coast. Foreign selling prices range anywhere from 3 to around 15 pct under comparable domestic items.

The U. S. military is buying Japanese barbed wire heavily for use in the Pacific where they formerly shipped it out from the U. S. Reason: lower price, and saving on freight charges.

Leads Sales Parade

Manufacturers wire, in strong demand through most of this year, is slated to do even better early next year. Strong demand is expected from such key consumers as automakers, fasteners, and furniture manufacturers.

Demand for spring wire is so heavy in some areas that consumers are sending trucks to producers' doorsteps for emergency loads to keep plants going. Heaviest demand is coming from auto seat, mattress, and furniture makers.

Road mesh demand, normally light during cold weather months, shows no sign of easing. Highway construction programs will consume wire mesh as long as weather permits.

Nails, a merchant wire product normally slack during autumn and winter buying periods, have shown substantial gains this year compared to '54. Middle West producers report first half of '55 sales 125 pct over the same period a year ago.

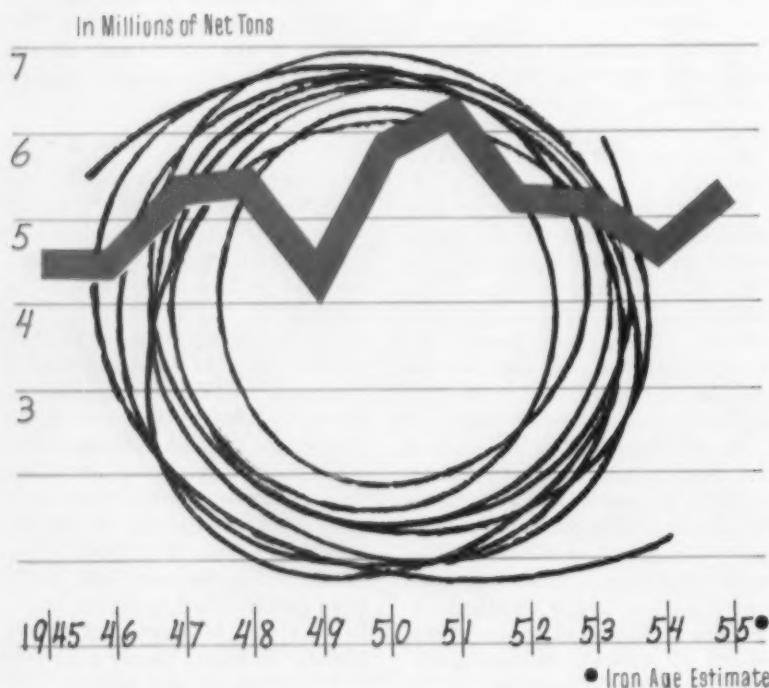
Barbed and twisted barless wire, bale ties, and woven wire fence were hit by a slowdown in farm demand. But the outlook is good for a comeback in spring. Most producers are building up their inventories. They don't want to be caught short should farmers put on a buying spurt.

Shipments Up

This year's wire rod shipments compare favorably with record 1951 when the industry moved over 6 million tons. The '51 total was due to military demand for barbed wire, building fabric, and road mesh during the Korean emergency. Shipments for most of the last 10 years have averaged between 4.4 and 5.4 million tons annually.

Among expansion projects to meet expected growing demand for wire is American Steel & Wire Division's new universal-type rod mill in Cleveland. The mill will have a capacity of 500,000 tons annually, is one of the world's fastest rod mills.

Wire Rod Shipments



Aluminum:

**Air Force extrusion presses
go to work at Kaiser.**

Nearly a million pounds of extruded aluminum per month is flowing from one of a pair of giant Air Force presses operated by Kaiser Aluminum & Chemical Corp. at Halethorpe, Md. And within a few more weeks, this output will be doubled as the companion press ("Rex" and "Regina," they're named) goes into production.

The two presses, built by Loewy-Hydropress, Inc., are 126 ft long, are capable of exerting force of 2700 tons. Main purpose of the presses is to provide the Air Force with structural components and to reduce the high-cost "bits and pieces" method of assembling aircraft.

Civilian Demand Up

Each of the new giant presses can extrude billets up to 85 ft long. While the military will get first crack at the increased output, Kaiser is after a greater share of the so-called civilian market. Kaiser has about 2 pct of the aluminum extrusion capacity in the U. S., and it is shooting for at least 15 pct.

Big gains in civilian demand for extruded aluminum will justify the Kaiser expansion plans. It's not a low-cost program, however: Halethorpe, without presses, cost about \$16 million, and Rex and Regina (owned by the Air Force and leased to Kaiser) cost about \$5 million each.

Payroll Shrinks

Federal payrolls shrank in September by about 19,000 workers for the first monthly decrease reported this year. Total government employment is about 2.4 million.

Most of the decrease was caused by large seasonal reductions in employment by the Agriculture and Interior Departments, although employment of the Commerce Dept., the Post Office, and the Army and Navy also declined.

Federal payroll for civilian workers for the fiscal year ending last June 30 totaled \$9.6 billion.



THESE billets will be used in the 8000-ton extrusion presses in the heavy press plant Kaiser Aluminum & Chemical Corp. will operate for the U. S. Air Force at Halethorpe, Md. Workman is tapping with an electric drill for a thermo-couple location in the billet.

Test Flying Platform

Army, with an eye to giving ground troops mobility, is testing two types of "flying platforms." If the one-man device is successful, it may become the "jeep of the air" in the future.

Army is negotiating with two firms, Hiller Helicopters, Palo Alto, Calif., and De Lackner Co., Mount Vernon, N. Y., for a limited number of two different types of the flying teacups to give an added margin of mobility to the infantryman on an atomic battlefield.

Army planners believe the fantastic flying machine could be used for duties ranging from reconnaissance to guerilla activities.

Speed Aircraft Buying

In the space of only a few weeks, the Air Force has placed orders for more than \$1 billion worth of latest type supersonic planes.

In addition, procurement of high-speed turboprop transports, urgently needed for fast movement of ground troops and mili-

tary cargo, is being stepped up.

Latest contracts include: Lockheed Aircraft Corp., more than \$100 million for F-104A "air superiority" fighters, and more than \$100 million for C-130A Hercules transports powered by four turboprop engines; McDonnell Aircraft Corp., more than \$330 million for three versions of its F-101 Voodoo fighter; Convair division of General Dynamics Corp., about \$390 million for F-102B delta-wing interceptors.

Grant Atomic Permits

A new group of 97 firms and persons is now eligible to inspect restricted government data on non-military uses of atomic energy. Nearly 500 such permits have now been issued by the U. S. Atomic Energy Commission.

AEC grants these permits to any interested person or company occupied in developing atomic energy for civilian use. All persons intending to make use of the new permits must undergo a separate security investigation.

EXPANSION IN INDUSTRY

Steel:

Granite City plans major expansion.

Granite City Steel Co., Granite City, Ill., is launching a new expansion program that will increase the company's ingot capacity by 30 pct.

The program will be completed in 1958, but first effects will be felt late next year in an increase in output of hot- and cold-rolled sheets.

Major part of the program, according to John N. Marshall, company president, will involve increases in blast furnace and openhearth capacity. This means rounding out production facilities which can now roll more steel than openhearths can produce.

The expansion will include construction of a 25 ft in diameter blast furnace with a capacity of 1200 tons of pig iron a day. The new furnace will replace the smaller of the company's two existing furnaces.

The new blast furnace will provide for an increase in openhearth production through a higher percentage of hot metal.

Auto Air Conditioners

Airtemp Div. of Chrysler Corp. intends to spend \$2 million to strengthen their competitive position in the field of auto air conditioners. The first step in the expansion program is scheduled to be construction of a new \$1.5 million production line for manufacturing air conditioning compressors.

A planned addition to the plant will cost \$250,000.

Tooling of a new line of low-cost home furnace units is expected to require \$180,000.

A similar amount is designated for retooling existing waterless air conditioner production facilities.

By the first of the year the company expects to hire several hundred new employees.

Sulfuric Acid

The Du Pont Co. will start construction immediately on a new sulfuric acid plant on the Ohio River about 20 miles downstream from Cincinnati. The new project is expected to be ready for full scale production late in 1956.

The Du Pont Engineering dept. is doing the building and the Grasselli Chemicals dept. of Du Pont will operate the plant. It will eventually replace the plant now being run by Grasselli at Lockland, Ohio.

More RF Mills

Yoder Co., Cleveland, world's largest producer of roll forming mills last week announced a \$4.5 million expansion. According to president Douglas A. Yoder, incoming orders next year will run 50 pct over this year.

Expansion Briefs

General Electric Co.; taken options on 1585 acres for development of nuclear facilities; San Francisco, Calif.

U. S. Steel Corp.; new line for production of vitrenamel sheet, porcelain enamel; Irvin Works, Dravosburg, Pa.; completion late in 1956.

C. H. Wheeler Mfg. Co., Phila., Pa.; formed division for work on heat exchangers, pumps and valves for atomic energy generation.

Reynolds Metals Co.; boost capacity of Listerhill, Ala., plant from 100 million lb to 140 million lb, primary aluminum; \$11 million; August 1956.

Fairchild Aircraft; leased plant facilities of Jonco Aircraft for manufacturing and related activities; Shawnee, Okla.



THREE new open hearth furnaces are being added to Middletown, Ohio plant of Armco Steel. Two will be ready by Spring, the other at end of 1956.



Struthers Wells

The six jacketed, water-cooled rolls in this Cooling Room Stack are Struthers Wells Weldments.

Each of these jacketed rolls has a 34" diameter and a 6'0" face.

FOR WELDMENTS

Complex or Simple—
in any combination of
Weldable Materials

Count on STRUTHERS WELLS

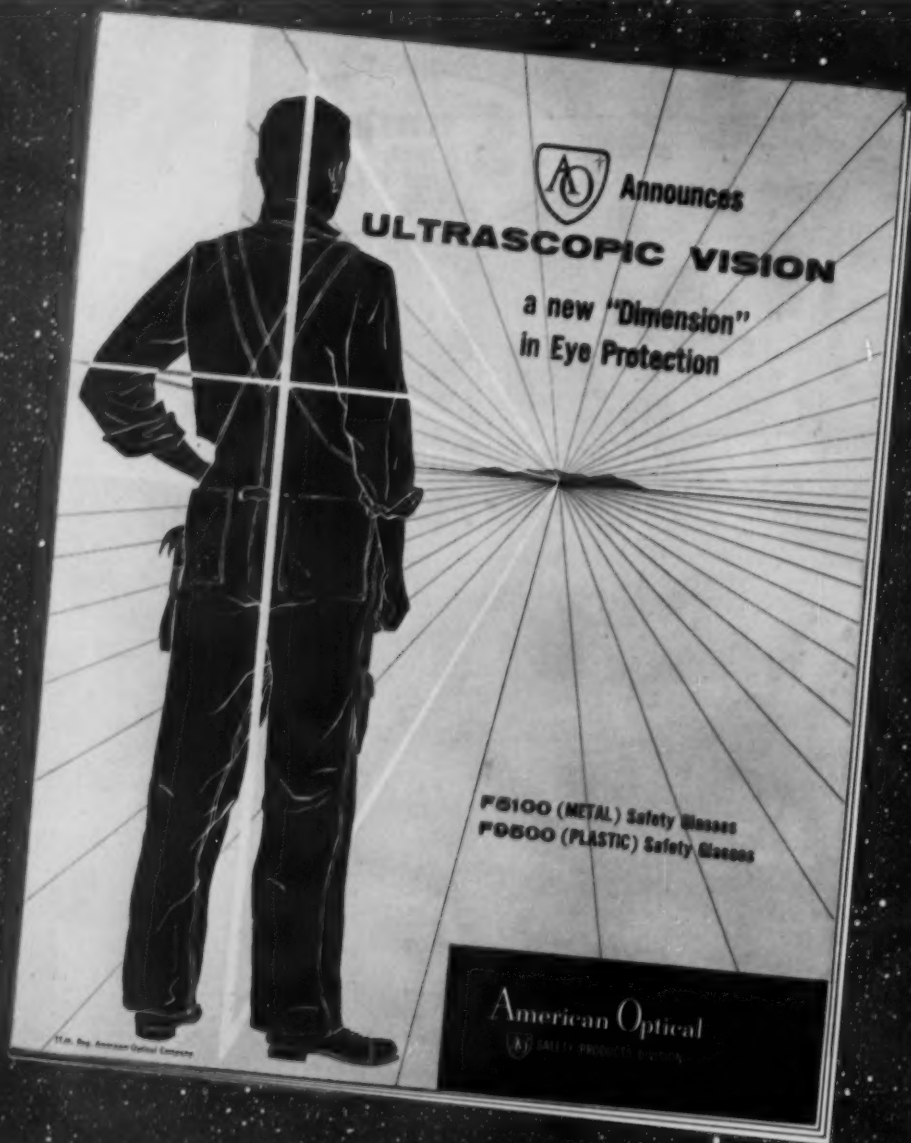
Whether they be large, heavy and accurate or small and precise . . . whether they comprise a complete unit or a component for your own fabrication—come to Struthers Wells!

Using the extensive facilities of three modern plants, Struthers Wells combines plate, rolled sections, forgings, small castings and other elements as required. Struthers Wells does the entire job, being equipped for forging, cutting, welding, heat treating, testing and machining—in any degree of precision, size and quantity. Write for *Weldments* bulletin.



**STRUTHERS WELLS
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TITUSVILLE, PA.**

Plants at Titusville and Warren, Pa.
Offices in principal cities



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of Ultrascopic Safety Glasses? Be sure to get it . . .
these evolutionary products will make your protection job easier.*

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for
cutlery
and other special
stainless steel applications
where a bright
heat-treated surface
is essential

SUPERIOR



bright-annealed

or

hardened and tempered

STAINLESS STRIP STEEL

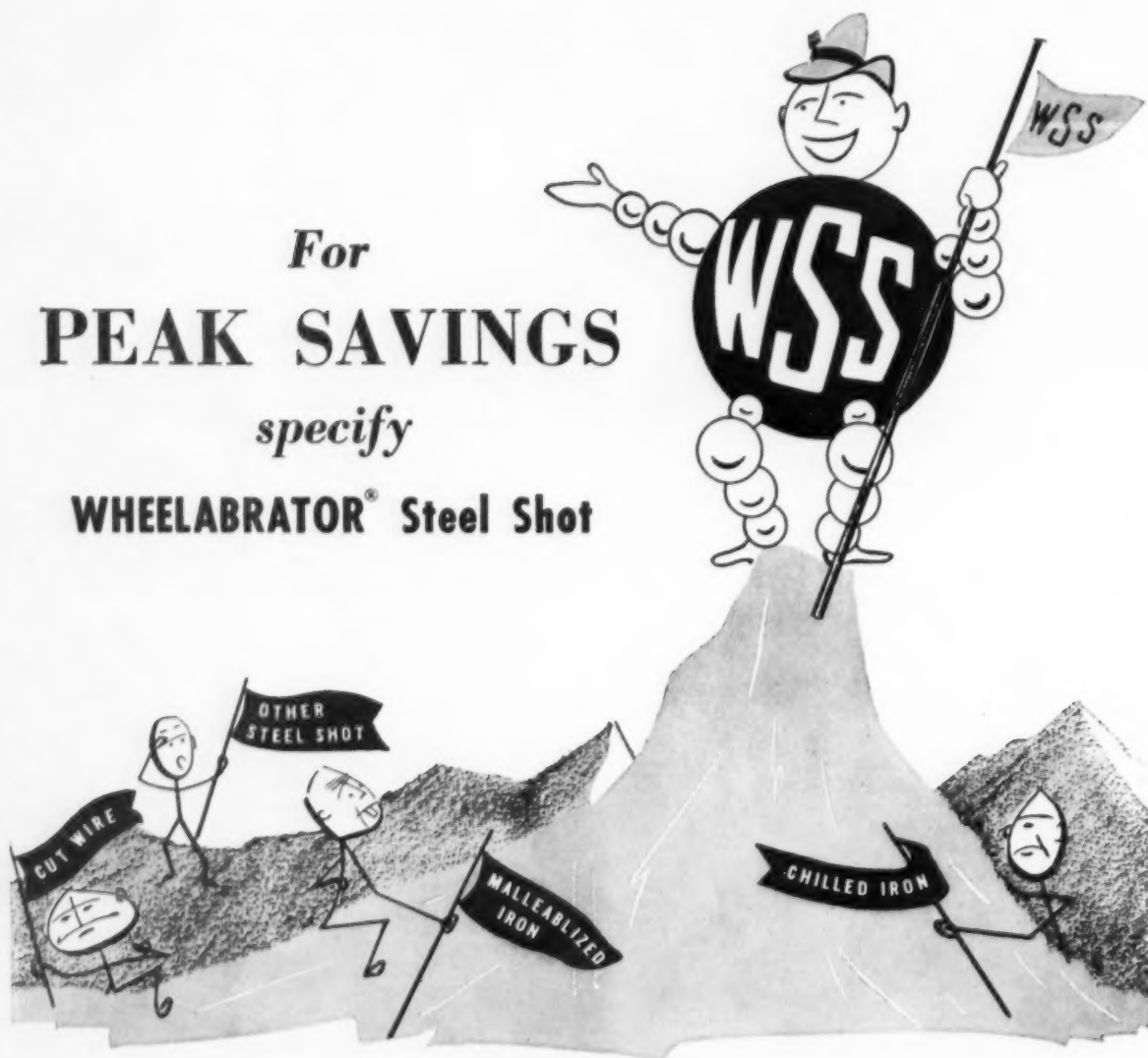
Superior Steel

CORPORATION

CARNEGIE, PENNSYLVANIA

Made in our new, bright heat-treating furnace—in widths up to 20 inches, and in thicknesses from .015" to .065". Write for quotations on your requirements.

For
PEAK SAVINGS
 specify
WHEELABRATOR® Steel Shot



Wondering how you can choose one abrasive over another when they all look so much alike? Don't buy on appearance alone. Buy on proved performance. Let the cost-saving performance of Wheelabrator Steel Shot pay off in faster cleaning, more cleaning and better cleaning for every pound — for every pellet. Wheelabrator Steel Shot is made under such rigid controls that it achieves uniformity from pellet to pellet in hardness, roundness and toughness never before possible. No other abrasive ever reaches the *peak* performance that is the daily performance of Wheelabrator Steel Shot. Let this *peak* performance bring you *peak* savings. Use Wheelabrator Steel Shot. Write for Bulletin 89-B.

**Wheelabrator® Steel Shot is
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- 1 Only Wheelabrator Steel Shot is produced to such exacting standards.
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- 3 Only Wheelabrator has such complete facilities for shot production.
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510 S. Byrkit St., Mishawaka, Indiana

Trail Blazer of Industrial Progress

Report to Management

Balanced or Else

You will get both good and bad financial news from Washington in upcoming months, but emphasis will be on the good. With tax receipts coming in at a rate far ahead of best estimates and elections just ahead, news has to be good for the most part.

The word is out that a balanced budget is in sight—give or take a few hundred million. You have seen this prediction for some months, but now it is close to an official statement.

Pressure for tax cuts continues to mount in all directions. If tax cuts materialize before the end of the fiscal year, the delicate balance could be destroyed. This makes a delaying action probable.

What the Treasury Dept. Thinks

A balanced budget is now the primary goal of Treasury Secretary George Humphrey. He is determined to get government out of the red even if it means taking an unpopular stand on tax and other financial matters.

You can expect him to oppose tax cuts until the balanced budget is a fact. He frowns on anything that will interfere with it, particularly now that it is well in view.

He will continue to buck anything that smacks of a give-away program. Proposals to cut receipts before the end of the fiscal year will get the knife if the Secretary is empowered to wield it.

It's up to Congress

Tax laws are the direct responsibility of Congress. All the executive branch can do is recommend, veto, or influence. Remember that Democrats are in control, but that pressure for both individual and corporate relief is universal on both sides of the aisle.

Tax relief measures will be high on the agenda when Congress convenes. The Treasury Dept. wants extension of corporate and excise taxes.

Look for something like a compromise or face-saving measure from Congress, which wants the elective advantage of tax cuts, but also realizes that a balanced budget is practically a necessity.

Tax relief will be granted to individuals, with some cuts in excise taxes. The corporation level will remain where it is. Possibly the laws will be passed prior to the end of the fiscal year, but not to go into effect until the balanced budget is in the bag.

Construction and the Boom

There is little doubt that the tremendous activity in construction and building this year has been responsible for much of the continued high level of business.

You can expect increases in 1956 in the overall picture. There will be some decreases in farm and home building, but not enough to offset increases in commercial, industrial, public and institutional building.

Construction spending will reach a record-breaking \$44 billion next year, according to U. S. Commerce and Labor Depts. estimates. Private construction will hit \$30.85 billion, \$850 million over this year. Public spending will come to \$13.15 billion, an increase from \$12 billion this year.

Back to Durables

All this points out that the 1956 economy will have big backstoppers even if consumer demand should falter slightly. Heavy industrial and commercial building guarantees a subsequent major ordering of industrial equipment to operate in the new plants and additions. It's the best insurance for a good '56.

INDUSTRIAL BRIEFS

Wire Film . . . A black and white, 16 MM sound film entitled "Lifeline," discusses the use and manufacture of wire and rope, is available to engineering societies, clubs and associations on a loan basis from the Macwhyte Co., Kenosha, Wis.

Change of Name . . . Wallace Aviation Corp., recently acquired by Clevite Corp., is being renamed Clevite Aero Products, Inc.

Going Up . . . The Chicago Assn. of Commerce and Industry will occupy the street level and second floor of the Inland Steel 19-story stainless steel and glass building scheduled for completion by early fall of 1957.

New Building . . . Signode Steel Strapping Co. has announced plans for construction of an \$80,000 warehouse and office building in Buffalo.

Grad Study . . . Establishment of a graduate program in fundamental ceramics research, solid state physics, solid state chemistry, and the earth sciences, has been announced by the president of Alfred University.

New Quarters . . . Northern Engineering Works, Detroit, and the Electric Overhead Crane Institute announce that offices of the Institute are being transferred from New York to Washington.

Merger Completed . . . Kelsey-Hayes Wheel Co., Detroit, announces the completion of a merger with Steel Products Engineering Co., Springfield, Ohio, which both companies expect to provide an expanded operation into the aircraft and related fields.

Economic Survey . . . A survey by the U. S. Chamber of Commerce shows tax revisions and reductions top the list of five national legislative issues which businessmen feel have the greatest impact on competitive enterprise. Others are: federal and state right-to-work laws; retention of flexible farm price supports for agriculture; expanded federal highway system and federal vs. private development of water resources.

Equipment Obtained . . . The Service Foundry Div., Avondale Marine Ways, Inc., New Orleans, recently shipped four boxcars of gears and bearings to Wisconsin for the construction of a new lock.

Flashier Vehicles . . . GMC truck customers prefer trucks painted delta green, flame red, two-tone aqua blue and dover white. Only 2 per cent asked for black trucks according to a GMC Truck & Coach Div. color survey.

Press Line Acquired . . . Farrel-Birmingham Co., Inc., has acquired the hydraulic press line from the Watson-Stillman Co. The purchase includes: engineering and sales divisions, patents, drawings, jigs and fixtures for Watson-Stillman presses.

Outlook for Expansion . . . Electric power industry plans to spend \$2.8 billion on expansion this year, says the U. S. Chamber of Commerce.

Tank Cars . . . Six welded tank cars twice the size of conventional cars, will be manufactured by ACF Industries. Cars, with 22,000 gallon capacity, will be used to carry oil.

Companies United . . . Cleveland Cap Screw Co., and Standard Pressed Steel Co. of Jenkintown, Pa., have merged. The stock of Cleveland Cap Screw was exchanged for an undisclosed number of SPS shares.

Safety Record . . . General Electric's Laminated & Insulated Products Dept. has worked 6½ million manhours without a disabling injury to employers dating from October, 1950.

Opening . . . Birmingham's new one million dollar steel mill, Southern Electric Steel, is expected to produce between 30-35 thousand tons of steel annually by the first of the year.



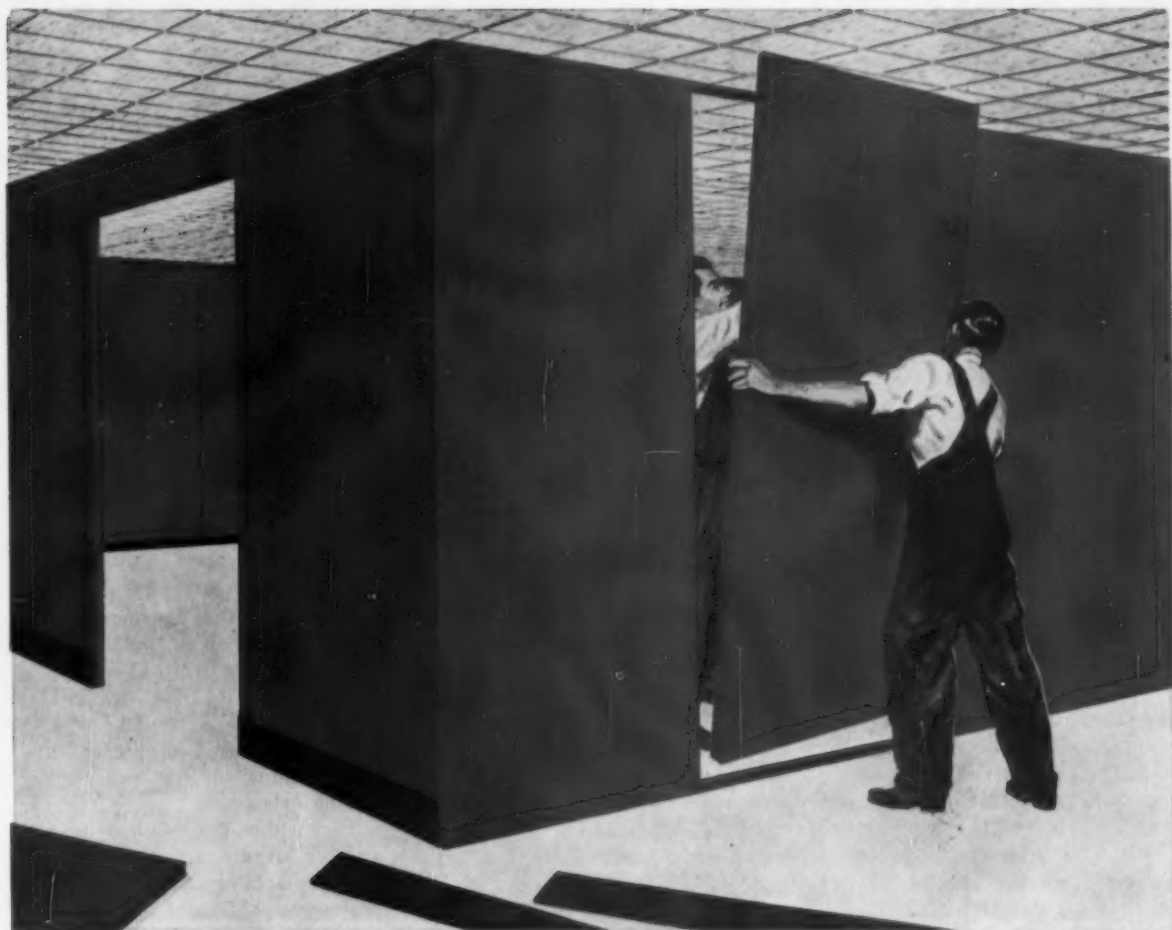
That's about all you have to do to contact one of Milford's 5 plants or 20 offices! And Milford means fast deliveries, top quality and service — always!

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Plants: Milford, Conn.; Norwalk, Calif.; Elyria, Ohio; Aurora, Ill.; Hatboro, Pa.

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Headquarters for RIVETS
Tubular, split and special cold-forming
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Anticipate change with movable steel walls



Business can't afford to strait-jacket efficiency by the expense, dirt and confusion involved in the relocation of interior masonry walls.

That's why easily installed movable walls made of steel are hailed as the economical way to preserve office flexibility and retain structural stability.

J&L helps manufacturers of movable steel walls build dependability and attractive appearance into these modern

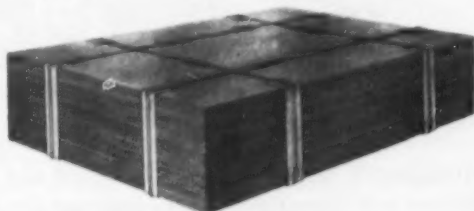
partitions. J&L furnishes the basic raw material—high quality sheet steel.

The acceptance accorded J&L Sheet Steel by movable wall builders shows how quality control is coupled with J&L's understanding of product end-use. Thus J&L assures customer satisfaction.

J&L offers you the same quality. Whatever your requirements for formability, uniformity and drawing qualities, you can depend on J&L for sheet and strip steel. Get the best out of your production equipment and add to the value of your finished product.



Jones & Laughlin
STEEL CORPORATION — Pittsburgh



Serving Steel Users Everywhere—linked by water to the Middle West and South



Automakers Risk Billions on Future

Stakes are high as automakers bet on future markets . . . GM spends \$4 billion since 1946 . . . Ford more than \$2.6 billion . . . Others push improvements and expansion to limit—By T. L. Carry.

♦ ONE OF the most fascinating things about the auto industry spending is not so much the huge amounts of money which are put into the planning and production of a product each year as it is the manner in which the money is spent.

An automaker of necessity must gamble with millions of dollars when planning a new product. But the amazing part of the whole operation is the fact that a company must spend the money anywhere from 3 to 4 years before a car rolls off the assembly line. That's a big gamble in any man's language.

Anything Can Happen . . . Although it is possible to have a broad idea of the future size of the market for a car, anything can happen to change the picture long before the car becomes a reality

and after a good deal of money has been spent on the project.

The gambling instinct and the ability to collect the stakes are prerequisites for the auto industry. This is true not only of new car planning but is also the case when it comes to expanding and modernizing manufacturing facilities.

From 1946 until present projects are completed in 1958, the industry will have spent over \$7 billion on new plants and modernization of existing facilities.

Big Spenders . . . Biggest spenders are the Big Three. General Motors Corp. is at the head of the list with an expenditure of \$4 billion. Ford is second with \$2,650,000,000 and Chrysler's expansion costs total \$763 million.

Studebaker-Packard and American Motors Corp. have spent a

combined total of \$120 million, mostly on modernization, since the new companies were established in 1954.

L. L. Colbert, Chrysler president, now discloses that his company will spend more than \$1 billion in the next five years to broaden its production facilities. Included in this new capital outlay will be cost of land, buildings, machinery and other equipment, but not regular tooling expenses.

Part will be put into body plants, another large bundle into new assembly plants and improvements in present ones. Chrysler is now considering three East Coast locations.

And this is not the final figure, Chrysler indicates that if the company position changes, investment estimates may be raised.

The industry has spent the money for capital improvements in cities from coast to coast.

New Plants . . . Since 1946, Chrysler Corp. has purchased 18 various plants throughout the country. Twelve other parts and manufacturing plants, including the 4000-acre Chelsea, Mich., proving grounds, have been constructed. Other facilities which are scheduled for construction are a transmission plant in Kokomo, Ind., several central engineering buildings in Detroit and a new press plant in Macedonia, O.

In addition, \$50 million was spent for machine tools alone at the Plymouth engine plant in Detroit, which is the most modern of its kind in the world.

Ford's projects which have been completed so far include 16 new



STUDEBAKER, widely known for its liberal and individualistic styling, has returned to a conventional industry approach with its 1956 models. Champion Two-door is one of 16 basic models.

Extra economy and efficiency achieved in plating operations

◆ United Chromium puts unique experience to work in engineering plating installations . . . users benefit

◆ Innovations in equipment also developed . . . service improved, costs cut

A long working knowledge of plating plants is now being applied by United Chromium to aid companies with their equipment needs. This help assures better operations, and a better return from the equipment. For example:

COMPLETE INSTALLATIONS COORDINATED

A tractor builder needed chromium plating facilities for new production needs. United Chromium engineered the installation as a complete "package." The company thereby got a compact, efficient arrangement . . . the right tanks, rectifiers, controls and accessories to do the job . . . time and money-saving operations right from the start.

SUBSTANTIAL SAVINGS

United Chromium was called in to survey requirements for a new anodizing set-up to be used for aluminum aircraft parts. Result: The airline gained the most efficient installation for its needs. A big saving, too. On cooling equipment alone, it spent \$5,000 less than called for in a previous estimate. It also gained superior equipment, a good example being Unichrome acid-proof tantalum cooling coils which minimize downtime and replacement costs.

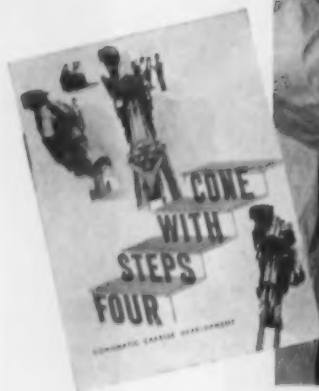
There are many United Chromium developments in equipment, processes, and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.



METALLIC and ORGANIC FINISHES...EQUIPMENT

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First with NEW "Automatic" Service

Cone was the first builder of multiple spindle automatics to provide machine users with an experimental service in the application of carbide tools.

This service is a practical means of determining the possibilities of carbide tools for production men without loss or interference with their regular production schedules.

A pamphlet "FOUR STEPS WITH CONE" describes this service. Send for your free copy.



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Nov. 12, 1955	187,405	28,204
Nov. 5, 1955	173,000	26,950
Nov. 13, 1954	119,424	22,182
Nov. 6, 1954	96,101	20,474

*Estimated Source: Ward's Reports

manufacturing plants, 10 assembly plants, 19 parts depots, 7 engineering buildings, a desert proving ground and a new office building in Dearborn.

When the projects presently under construction are completed, Ford's expansion since 1946 will include 34 new manufacturing and assembly plants, 20 parts depots, and 23 engineering, research and office buildings.

More Jobs . . . There is no specific breakdown for GM's expenditures but the money has been spent for modernizing existing facilities and construction of assembly plants across the nation.

The major aspect of the expansion in the industry has been a huge increase in the number of jobs available. For the five years from 1950-55, General Motors created an additional 141,000 jobs.

Ford Stock:**Family will stay
in full control.**

The late Henry Ford might have been opposed to Wall Street and public ownership of his company, but he might get some consolation over the method of placing Ford stock on the market.

The stock offering has been so arranged that the Fords are not going to lose control of the company. The 7 million shares which will be offered to the public will carry 60 pct of the voting rights and the remaining shares which will be held by the Ford family will have a voting power of 40 pct.

Spread Wide

Inasmuch as the Ford Founda-

tion is going to see to it that the public stock gets the widest possible distribution, a private investor has very little chance of carrying any weight in the operation of the company. At the same time, the voting ratio of the stock will not change until such time as the family's shares dwindle below 2,700,000.

Speculation has increased as to why the stock is being offered and there are several factors which are involved in the sale.

Public Responsibility

First of all, the stock is not being offered because Ford needs the money. There is probably no other privately owned company in the nation in such an enviable financial position as Ford. All improvements and expansion that have been undertaken since 1946 have been paid for out of earnings.

But as the company progressed, its public interest and responsibility have also grown.

It is also true that the Ford Foundation will be better off by diversifying its holdings rather than having all its money tied up with one type of stock.

AUTOMOTIVE NEWS**Restyled Studebaker**

The new Studebaker, the newest and most radically changed car for 1956, is ready for the market. The body with a higher hood and a more massive rear deck has been completely changed to more conventional lines.

The new line includes 16 models—12 in the sedan and station wagon series and four in a sports-type group. The sports cars, called the Hawk series, feature engines which can develop 275 hp. Engines in the regular line of Studebakers are either 6 or 8 cylinder and produce from 101 to 210 hp.

The styling change was made with the idea in mind of making Studebaker more competitive in the low price field. The Hawk series is being produced to compete with other members of the industry who make sports cars. Studebaker's sports model bears a startling resemblance to the foreign-appearing Studebakers of the previous model years.

THE BULL OF THE WOODS

By J. R. Williams





"We ought to label this box LOST PROFITS"

Why? Because you lose the original labor cost when any part has to be reworked. Such loss usually exceeds the manufacturing profit. Is "rework" eating into your profits — unnecessarily?

Why accept rework loss? . . . You don't have to accept this loss as "fixed". The point in production where you spot cracks or defects determines whether you lose both time and labor.

Inspection with Magnaflux during manufacture finds *all* cracks when they first occur—suggests the cause and how it can be corrected—*before* parts are run in quantity. Magnaflux keeps cracked parts from being machined, holds rework at minimum, reduces loss.

Cracks, whatever the cause, whether from heat treating, grinding . . . cleaning, or handling,—all run up your labor costs if you don't find them early enough.

Inspection with Magnaflux is extremely low in cost, and is fast. Ask to have one of our engineers help you investigate how inspection with Magnaflux may save you money — or write for new booklet on LOWER MANUFACTURING COST.



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MAGNAFLUX



THIS WEEK
IN
WASHINGTON

U.S. Moves to Lop Off Defense Fat

Defense Dept. hopes to save \$500 million by June . . . Plan more careful procurement but no buying cutbacks . . . Economy drive will center on payrolls, frills and research—By G. H. Baker.

◆ **THE DRIVE** to save money at the Pentagon is being pointed primarily at military payrolls, personal frills, and secondary research programs.

There's no real push, despite some scare rumors, to cut back any existing procurement programs to any substantial degree.

A hypothetical savings goal of \$500 million by June 30 has been set by Defense Sec. Wilson. But Mr. Wilson does not intend to reach this goal by trimming back or canceling any outstanding contracts.

He does believe, however, that there's still plenty of "fat" in the military budget that can be boiled out in the next seven months.

Go Slow . . . Here's how the economy drive will show itself:

- A "go slow" attitude in placing new contracts. All services will pick and choose suppliers with great care.

- Secondary research will be cut back. This means that some long-range programs that show no immediate prospect of paying off are being shelved.

- Payrolls—both military and civilian—are to be trimmed by not hiring replacements.

- No new golf courses, swimming pools, bowling alleys, guest quarters on military bases. Projects underway can be finished, however.

Won't Ease Defense . . . The high cost of defense is here, to stay—until the Reds match up their peace talk with peace action.

This is now the official philosophy behind all Eisenhower Admin-

istration international planning. Ike's advisers are passing the word to congressional leaders that they see no evidence at this time to warrant any cutting down of U. S. military might.

What Ike refers to as "the spirit of Geneva" must be demonstrated in clear-cut disarmament moves before the Defense Dept. will even consider any major cutbacks in our military muscle.

Red Risk Remains . . . Thus far—so the White House cautions—there is no evidence that the Reds intend to go beyond the talking stage of their "peace" proposals. Let the Russians' actions suit their words, and then the U. S. will be prepared to talk seriously about some major reductions in U. S. defense spending.

This is the confidential outline on international policy being explained to leaders of both parties within Congress these days. It is being pointed out that defense spending must be maintained at not less than the existing level of nearly \$35 billion a year for an indefinite period.

To accept Moscow's siren song of peace without any concrete evidence of peaceful intent would be the most foolish mistake possible.

U. S. Moves Out . . . Closing of 32 more industrial plants or facilities is being proposed by the Defense Dept.

Appropriations committees of the Senate and the House have the last word on the matter, however. These committees insist on the right to cancel any proposal to close down any operation.

They're fearful the closings might irk the voters.

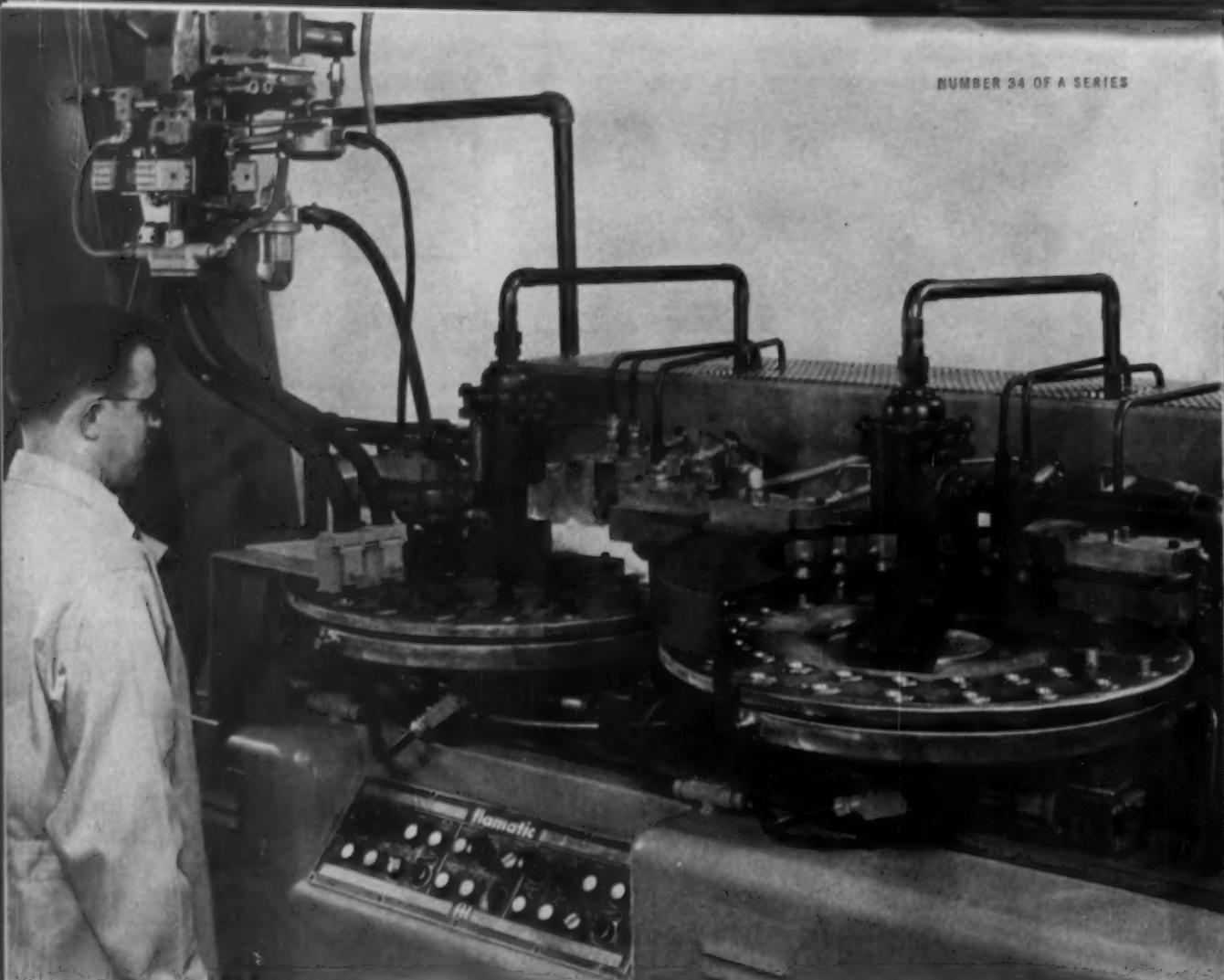
Assistant Defense Secretary Pike says the new list of anticipated closings is a continuation of the Administration's "aggressive program to take the government out of competition with private enterprise where this can be done without endangering the national security."

Cease Operations . . . The list of 32 installations includes the following kinds of enterprises: Chain manufacturing, cement mixing, cobbling, acetylene manufacturing, tree and garden nurseries, and office equipment repair.

Back on August 8, the Defense Dept. announced withdrawal plans affecting its coffee-roasting plants, rope-making, paint manufacturing, baking, dry cleaning, and cobbling. All of these were protested by the congressional groups.

Ask Steel Price Probe

Congress is going to investigate steel prices, a Senate Democrat says. Sen. Wayne Morse, D., Ore., complains that higher steel prices more than offset steel wage boosts. The industry should have absorbed the higher labor costs, and should have omitted any price rises, he figures. He adds that he'll have more to say early next year when the subject is opened up in public hearings.

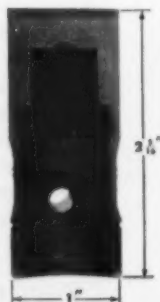


fully automated flamatic hardens 3600 parts/hour continuously

3600 hydraulic valve lifters per hour are continuously conveyed from a hopper to "carousel" type fixtures on this Cincinnati Flamatic hardening machine. The carousels index automatically after each heating cycle to bring a new pair of parts into position. Each lifter is selectively hardened to RC 57-61, to a $\frac{3}{8}$ " depth, and dropped into the oil quench. This is another demonstration that Cincinnati Flamatic engineers can match unusually high production rates and tight heating specifications by combining standard components with ingenious tooling.

Control cabinet, quench tank, and conveyor are standard, hopper-fed loading mechanism, turntables, and flame heads are special.

Look into Flamatic-hardening as a new approach to your heat treating problems. Bulletin No. 1861-M gives a wealth of good examples.



cross-section showing hardness pattern



flamatic

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Call Stockpile Vital

Western mining industry will virtually collapse when the government's stockpiling program ends unless tariff relief "or its equivalent" is provided, Western spokesmen say.

Even with stockpile purchases, most minerals are barely holding their own in the face of cheap foreign competition, the mining spokesmen say. Some 500 mining representatives have formed the Western Governors Mining Advisory Council to push for congressional action.

Flood Area Contracts

Defense Dept. has placed about \$123.5 million worth of procurement contracts in the New England and Middle Atlantic flood areas in the past eight weeks. In addition, the Army Engineers are undertaking flood control projects in the damaged areas valued at another \$27 million.

Waste:

U. S. asks business comments on needless reports.

Hoover Commission found that it costs government at least \$2 million a year to collect statistics from businessmen—some 4700 different questionnaires and reports are used.

The total "business" of furnishing, compiling, disseminating and deciphering government statistics has been called a \$5 billion business.

Savings possible by eliminating all duplication and waste could amount to as much as \$255 million a year for both government and business, the Hoover group says.

If the present Employers' Quarterly Income Tax return were simplified and coordinated with similar reports requested by other agencies, for instance, business would be saved \$22 million a year.

Report High Cost

Recent cases cited include a proposed Defense Dept. security system survey, which would have cost a medium-sized plant \$75,000

to \$100,000 to complete. The information was available in government already. That questionnaire has never been sent out.

A meat packing concern reports it spends 2.4 million man hours a year completing federal, state, and local information forms.

A proposed Civil Aviation Board survey of airline insurance, which would have cost \$2 million, was reduced to a post-card inquiry as a result of a study.

The Council and Budget Bureau are interested in making sure that the government and business are getting the best possible statistics as quickly as possible, but that business isn't being unduly burdened.

Complaints can be sent to the Advisory Council on Federal Reports, 1001 Connecticut Ave., Washington 6, D. C., or to trade association officials.

Titanium Strategic

Titanium is a strategically valuable material to the government, and a recent action closing the expansion goal for sponge production does not reflect any loss of faith in the metal.

The expansion goal was closed,



"Don't mind me using your strop do you? Misplaced mine."

WASHINGTON NEWS

say government spokesmen, because present capacity is in excess of "projected" use for the next two or three years.

Industry spokesmen are urging that a 90-day lead time be established for the industry to assist producers in scheduling production and provide better quality control of products. They also want the government to purchase sponge for the strategic stockpile, and are opposing further purchases of sponge from Japan.

Selenium Shortage

Shortage of selenium is so critical that the government is asking television and radio repairmen to salvage discarded rectifiers so the selenium can be recovered.

Selenium supplies, inadequate for the past several years, received a further setback last summer as a result of work stoppages in the copper industry. It is important in the production of military electronic equipment and special stainless steels and steel castings, is a by-product of copper refining.

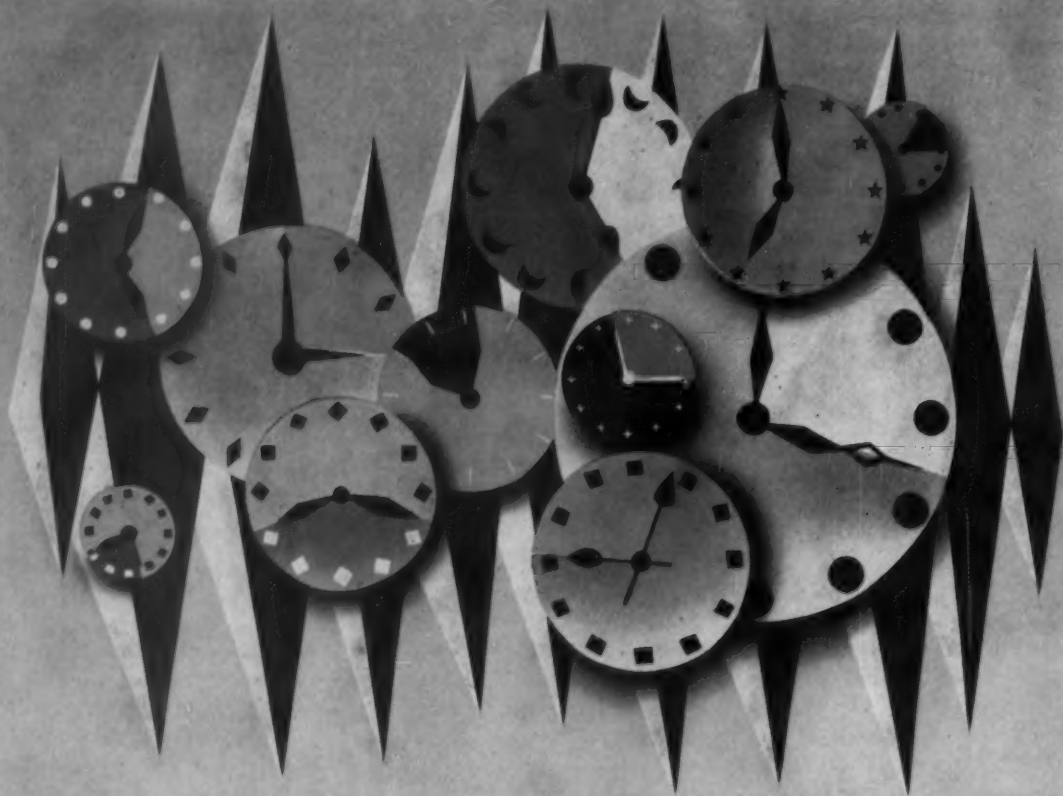
Better Worker Data

Government is going to expand its system of collecting employment-unemployment statistics to increase the accuracy of the monthly reports.

Beginning about the first of the year, the Census Bureau will gather employment data from 35,000 homes, instead of the 21,000 now used, and check on 330 areas, 100 more than at present.

Against Auto Curbs

Automobile producers should be allowed to expand without government interference. Chrysler President L. L. Colbert told Washington hearers of his company's expansion plans and said there was plenty of legitimate work for the government to do as an economic balancing factor.



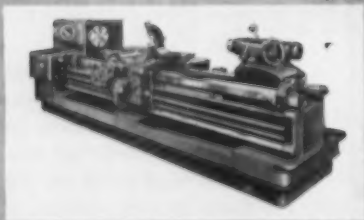
"beat the clock"—is no game

"Beat the Clock," a famous television program, has become a popular home party game. But industrialists know that getting the most out of every hour on the time clock is no game, but a serious competition for business survival.

The answer is not one of getting tough and bearing down harder.

It's a problem, rather, of providing equipment that permits a man to work at a higher standard of productivity. When

it comes to lathe work, that's an Axelson—a lathe with honesty in its design and integrity in its construction. Call or write us. We'd like to drop in and tell you about it.



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Smog Becoming Big Dollar Headache

Farwest smog problem threatens health, industry, and property values . . . Complete irradiation is counted out . . . Carburetor cut-off device will aid control . . . West Virginia woos West—By R. R. Kay.

♦ SMOG is fast becoming the number one economic problem in the Farwest—seriously threatens living, business, and property values. People and industries headed this way may soon think twice before starting out. Latest word from some scientists: Smog's here to stay. Learn to live with it, control it, for you won't get rid of it.

Southern California is no longer alone with the menace. Phoenix, Ariz., boasts that it's coming of age industrially. Long proud of its clear desert air, it now has the eye-irritating stuff. And worried words come from Seattle, where experts see heavy smog attacks on the way.

Cite Smog Producers . . . After 50 years of tub-thumping for an industrial westward-ho movement to Los Angeles county, its Chamber of Commerce pulled in the welcome mat on smog-producing industries.

Prime blame for the smog shifts as often as the wind. But Seattle, Phoenix and Los Angeles experts agree it's automobiles, industry and incinerators.

What's being done about it? Attack is red-hot in Los Angeles. Battling it are government, civic and industrial groups. Eight universities and research outfits have contracts from the County's Air Pollution Control District. Major projects: (1) How to control hydrocarbons from auto exhausts. (2) Identifying air contaminants. (3) Analyzing them. (4) Finding how wind patterns affect smog formation. (See *THE IRON AGE*, West Coast Report, Aug. 5, 1954.)

Cutoffs Will Help . . . Any progress? There's hope for control of auto exhaust. Cars and trucks now produce 55 pct of Los Angeles' aerial junk—pour out 1100 tons daily of smog-forming hydrocarbons, experts report. But a carburetor cut-off device promises to cut this in half.

Chrysler, Ford and General Motors have devices that work—are pooling interests to make a standard, inexpensive model.

East Woos West . . . Here's a reverse twist . . . an eastern state pitching West Coast companies to expand eastward! West Virginians are giving the plan top-level treatment. Young Gov. William C. Mar-

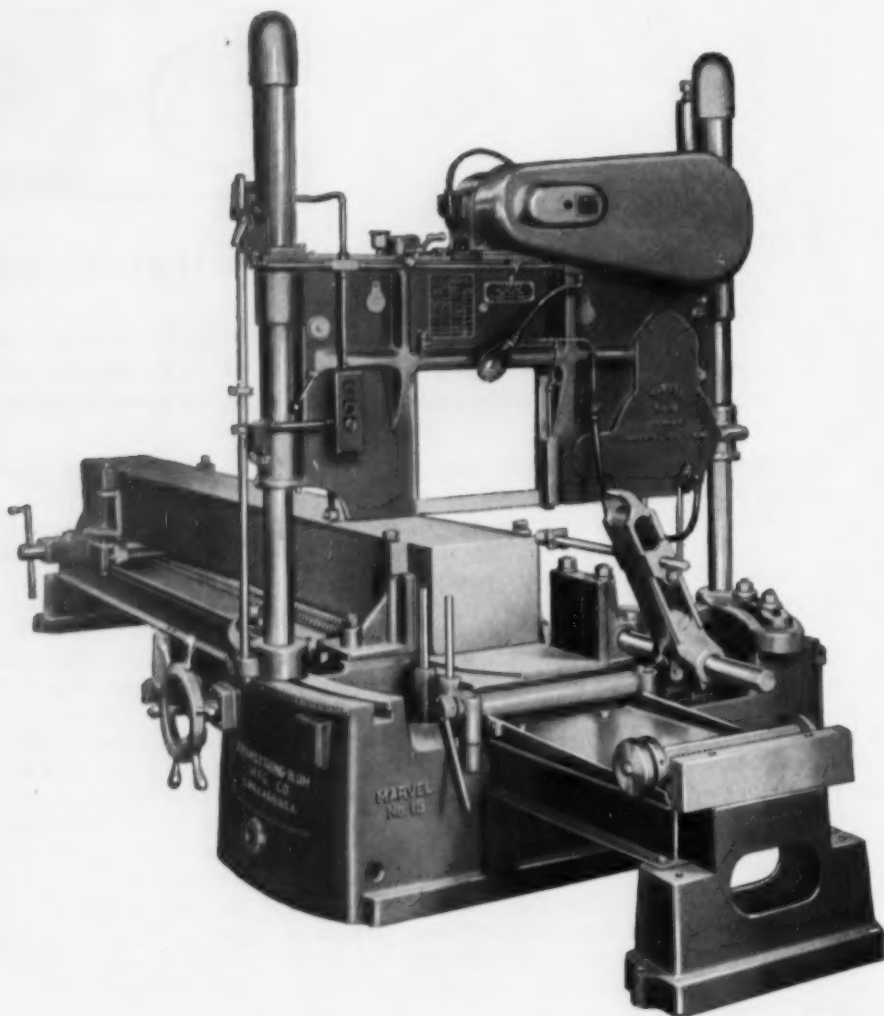
land hit the road to sell his state to farwestern firms.

Here's how the governor figures it. Many West Coast companies are now—or soon will be—big enough to sell in the huge eastern markets. To do a good job, they'll need nearby plant, service, or distribution facilities. West Virginia's just the place, says Governor Marland—labor's plentiful; and the state's heavy on ferrous and nonferrous primary metals production.

In an exclusive interview with *THE IRON AGE*, Governor Marland named three West Coast industries as likely prospects: Aircraft and parts, electronics, chemicals. It's a long range plan, but he feels the West will go East.



WORKMEN in the Navy owned, Convair operated guided missile plant at Pomona, Calif., work on the aft guidance housings for the surface-to-air Terrier for USS Boston, Navy's first guided missile cruiser.



No Job too big or too tough . . . for MARVEL "Giant" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of **BIG WORK**. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

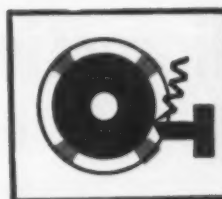
In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

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**MACHINE
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HIGH SPOTS**

Can You Stockpile Production Tools?

U. S. still has \$170 million appropriated for long lead-time machines . . . But revival of buying program unlikely . . . Military services see special tools obsolete in two years—By E. J. Egan, Jr.

♦ **DEFENSE** Dept.'s stop-purchase order on long lead-time machine tools for its war mobilization reserve (*THE IRON AGE*, Nov. 3, p. 83) isn't likely to be lifted in the near future.

This is apparent despite Pentagon word that the \$200 million tool-buying program is merely being halted for a top level review of spending plans. Approximately \$170 million remains unspent.

Real reason for the stop order is the tremendous rate at which new weapons are being designed. Pace is so rapid and changes are so radical that special-purpose tools for making today's implements of war become obsolete very quickly.

Deny Economy Motive . . . Military production men emphasize that the current holdup on reserve tool purchases is not a part of the Administration's drive to balance the federal budget.

They admit that Defense Sec. Wilson's target date for an overall \$500 million reduction in the military budget is next June 30. But the cutback on long lead-time tools is not figured in this sum. Bulk of such tools, even if ordered, could not be produced nor paid for until long after that date.

Actually, top military strategists now believe that most special-purpose tools used to produce today's weapons will be totally obsolete in another two years. As a result, the Pentagon is reluctant to spend the remaining \$170 million in its modified "Vance Plan."

How Program Started . . . In December, 1952, a committee headed by Harold Vance, former

Studebaker president, recommended that the government spend about \$300 million annually to stockpile special-purpose machine tools and war production facilities.

Production capacity for modern arms was deemed more important than huge reserves of actual weapons that would become more obsolete year by year.

The Defense Dept. went along with the Vance Committee theory, put together a \$250 million tool buying program for the three military services as a starter. Congress wouldn't appropriate all the money at once, but did allocate \$100 million for 1955 and 1956.

Program Lags . . . To date, no '56 funds have been spent, and only about \$30 million of the 1955 sum has been committed in firm orders. The Army and Navy, al-

located a total of about \$15 million from the 1955 appropriation, have spent most of their money.

But the Air Force, granted \$85 million almost 18 months ago, couldn't seem to get started. It did commit \$15 million in contracts during that period, and is understood to have been "negotiating" for another \$52 million in tools when the halt was called to further buying.

So now, with weapons designs and accompanying tool requirements changing so rapidly, the entire philosophy of the Vance Committee proposal is under critical study.

In all likelihood it will take much time and many conferences to decide what, if anything, is to be done with the unspent \$170 million.

Protest Looms . . . Meanwhile, criticism can be expected to mount. Plans for mobilization readiness do not include huge reserves of weapons.

And now, with tool buying stopped for an indefinite period, many observers say that even the availability of specialized production facilities in case of an emergency seems to be in doubt.

Defense Dept. officials point out that they could silence this criticism from many sources by spending the remainder of their "Vance Plan" money, and then quietly scrapping the tools as fast as they become obsolete.

But they have no intention of doing this unless Congress, either of its own accord or reacting to outside pressure, acts to force the issue.



"Didn't I tell you he'd get the ax some day?"

New, radio-active, automatic fire guard !

C-O-TWO PRE-DETECTOR SYSTEM



Each pre-detector head protects up to 3,600 square feet of area... harmless radio-active element utilizing ionization chamber principle quickly detects all forms of fire... requires only simple two-wire circuit and insignificant wall space for controls.

This completely new and positive means of spotting fire is just what you've always needed and wanted... detects in the earliest stage, invisible combustion gases, visible smoke, slow smoldering, as well as open flame. The C-O-TWO Pre-Detector System is simple to install, extremely economical to maintain and doesn't depend on thick smoke or heat for actuation.

As many pre-detector heads as necessary can be connected together in a single circuit and up to 16 separate circuits or spaces handled by one system. With a single circuit the pre-detector heads are connected directly to the fire indicating cabinet, while with multiple circuits the pre-detector heads are first connected to one or more space indicating cabinets capable of visually showing by number the exact location of the fire. Relays perform such functions

as sounding alarms, closing fire doors, shutting down ventilation and releasing fire extinguishing systems.

The C-O-TWO Pre-Detector System has been subjected to extensive testing and carries Underwriters' Laboratories, Inc. listing, as well as Factory Mutual Laboratories approval. Proven pilot installations have been made in such diversified properties as a television station, an electric power company network analyzer room, a railroad signal tower, an airline flight training equipment room and the offices of an insurance company.

Don't take unnecessary chances any longer... the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts about this new C-O-TWO Pre-Detector System today!



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November 11, 1954

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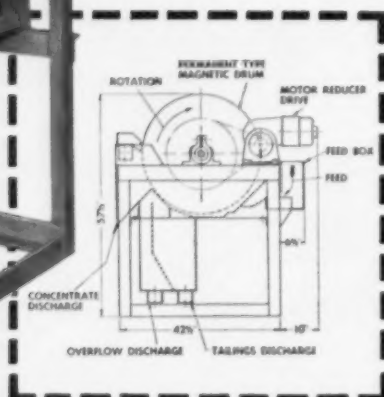


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new wet-drum magnetic separator for taconite concentration

Here is the Stearns-type WPD Magnetic Separator—a powerful new, wet-drum, permanent magnet unit designed for cobbing and roughing in taconite concentration.

Specially designed magnet not only has a deep, powerful field, but also provides correct flux distribution for positive transport of the collected magnetics to the discharge point. Both of these factors mean highly efficient magnetic recovery for the type WPD Separator.

Designed to Give You Low Cost, Rapid Recovery in Taconite Concentration

Steady Material Flow — Minimum Drum Wear. Separation tank and feeder provide a gravity flow from feed to non-magnetic discharge section — eliminate settling of coarse particles in feed tank. Feeder design keeps wear and abrasion on cylinder at a minimum.

Uniform Feed Distribution across entire drum width through special baffle system further insures high magnetic recoveries.

Concurrent Feed Eliminates Wipers and Wash Spray. Feed flows in same direction as drum rotation so any carry-over on drum is re-introduced to magnetic field. This means no wash spray or wipers are needed.

Single Drum or Individually-Controlled Multi-Drum Units Available. Two- and three-drum separators incorporate repulping boxes for control of feed solids at each transfer point — permit re-cleaning of concentrate when needed. Each drum is driven by a separate motor for positive, individual speed control. Waterproof drum construction.

Low Operating Cost. Horsepower requirements are low, yet plenty of power available when heavy load occurs. Drum turns on anti-friction bearings. Non-magnetic drive components do not attract magnetic particles, thus reducing wear on chains and sprockets. Powerful Alnico permanent magnet requires no external energization, minimum of maintenance.

Utmost Simplicity in Operation and Maintenance. One man can control a large number of units. Separator is easy to disassemble and put together. Removable feeder also simplifies maintenance.

Minimum Floor Space. Compact separator is easily set up and installed.

Write for complete details on this new, efficient type WPD taconite separator.

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The Iron Age

SALUTES

John E. Martin He runs a big company from the front lines, rubbing elbows with plant people and working closely with customers. He dispenses with executive frills, works in fast, direct ways.

The Dana Corp. of Toledo had always shied away from publicity. Makers of automotive parts, the company goes back (as Spicer Manufacturing) to the beginning of the century and had a somewhat distant attitude toward the outside world.

All this changed in 1954. The name, Dana, began cropping up more in publications and conversations. Relations took on a warmer note. Big reason for the change was Jack Martin. A tall, free-wheeling man, Mr. Martin was brought in as part of a youth movement in 1952. He became president in 1954 and personally sparked a program of public relations. Working with customers and mingling with plant people, he promoted closer ties outside the company and within. He functions as an overall salesman, spends as much time away from his desk as at it.

At the same time, Mr. Martin made sure the company had something to talk about. He pushed expansion and modernization with moves that included purchase of a Detroit frame plant, modernization of Pottstown, Pa., facilities, and a

\$5 million expansion and modernization of the Parish Pressed Steel Div. Under his leadership the company has gone ahead with product development and marketing, kept costs trimmed to a competitive edge.

Mr. Martin operates without executive frills. His office door stays open. You don't have to wade through a battery of secretaries to see him. He is a down-to-earth, forthright man who lets you know where he stands but is always courteous and considerate. He is energetic in everything, work or play. He gets along well with factory workers and vice presidents.

Mr. Martin was born in Covington, Ga., went to Bryson College at Fayetteville, Tenn. He joined Link Belt Co., Chicago, in 1927, stayed there until 1942. During the war he served as deputy chief of Army Ordnance's artillery division. In 1945 he became vice president in charge of operations for American Type Founders, Inc. In 1947 he went to Firestone Steel Products Co., Akron, Ohio, where he served five years as president prior to joining Dana Corp.

"Operations Kingsbury"

drills tubular valve in 5 seconds

A large manufacturer sent us a small piece of steel which had been partially completed on a screw machine. He said: "Drill five holes and remove the burrs . . ." That's a job for any drill press!

But when he said: "I want over 700 pieces an hour gross . . ."

THAT'S A JOB FOR A KINGSBURY.

Here's the machine. Four horizontal units and one vertical unit are mounted on a 72-inch diameter semi-circular base. A 20-inch table with four work-holding fixtures indexes through four stations.

Work is performed at three stations, as follows:
Station 1: Unit 1-H with two-spindle offset auxiliary head, drills two holes from one direction, while Unit 1-Rear with a single spindle auxiliary offset head, mounted on the other side of the base, drills the opposing hole.

Station 2: Units 2-HTL and 2-HTR drill opposing holes.

Station 3: Unit 3-V, with special burring tool, removes the burrs from five holes.

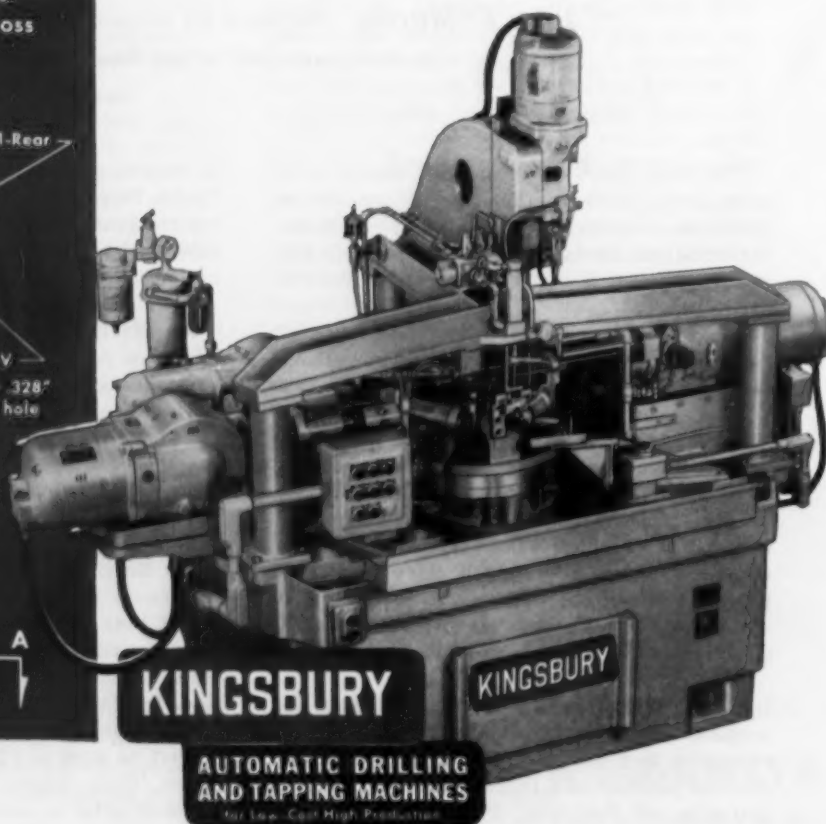
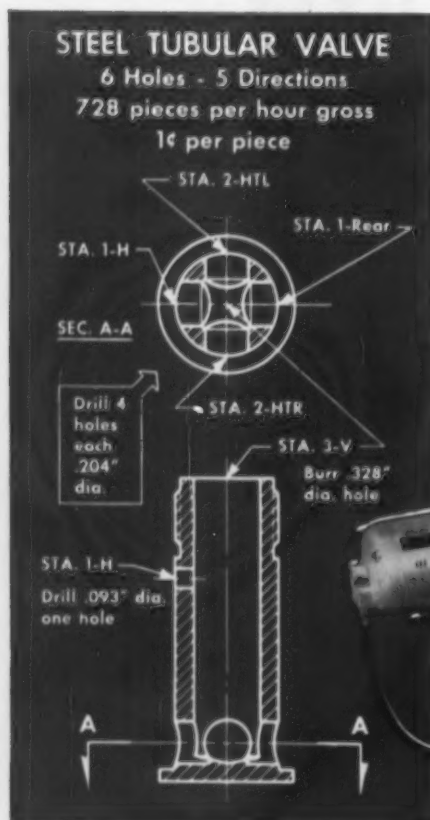
At Station 4 the work-holding fixture automatically releases the piece and ejects it through the bottom of the fixture. The operator then reloads. The piece is clamped automatically in the fixture with the flange at bottom.

This job, while relatively simple, presented problems. To produce upwards of 700 pieces per hour, more than one drilling operation had to be performed during a working interval. Notice also that, beyond the full diameter of each of the four .204" dia. holes, the bottom of the larger central hole is "end-milled" by the .204" drill. This necessitated drill bushings located on the fixture as close to the work as possible. In fact, all three drills are guided by bushings to insure accuracy.

An output of 728 pieces per hour is approximately one piece delivered every 5 seconds. We provide maximum time for loading by unclamping and unloading the fixture automatically at the end of the work cycle.

When you buy a Kingsbury you acquire a custom-built machine, complete in every detail!

Kingsbury Machine Tool Corp.
114 Laurel Street, Keene, N. H.



The Iron Age INTRODUCES

Elmer F. Twyman, appointed vice president, **The Yale & Towne Manufacturing Co.**, New York; **John A. Baldinger**, appointed general manager, Materials Handling Div., Philadelphia; **Roy L. Wolter**, named general manager, Automatic Transportation Co., Div., Chicago.

W. F. Shurts, appointed vice president, engineering, **Twin Disc Clutch Co.**, Racine, Wis.

Paul F. Handley, named sales manager, Tile Div., **Porcelain Enamel Products Corp.**, Rehoboth, Mass.

John M. Anspach, appointed manager, foundry and pattern shop, **De Laval Steam Turbine Co.**, Trenton, N. J.

Frank A. Rowe, appointed superintendent, combustion engineering dept., **Republic Steel Corp.**, Cleveland.

A. I. Aalto, appointed plant facilities manager, **Alco Products, Inc.**, Schenectady.

Leonard Tofft, appointed div. superintendent - blast furnaces, Geneva Works, **U. S. Steel Columbia-Geneva Steel Div.**, Provo, Utah.

Kent R. Manning, appointed general manager, Jackson Div., **Aeroquip Corp.**, Jackson, Michigan; **Wayne G. English**, elected treasurer.

A. W. Rose, appointed vice president and general manager, Petro-Mechanics Research Div., **Borg-Warner Co.**, Chicago.

Bruce D. Henderson, appointed operating vice president and general manager, air conditioning div., **Westinghouse Electric Corp.**, Pittsburgh; **John A. Gilbreath**, named manager, packaged products dept.

Robert E. Hunter, appointed general sales manager, Detroit Engine Div., **General Motors Corp.**, Detroit.

Franklin G. Folger, appointed comptroller, **Peter A. Frasse & Co., Inc.**, New York.

Henry Thompson, appointed sales manager, **Industrial Radiant Heat Corp.**, Gladstone, New Jersey.

C. T. Cosser, appointed application engineering manager, **American Electronics, Inc.**, El Monte, Calif.; **Glenn E. Ronk**, appointed general manager; **Hal S. Davis**, appointed western sales engineering manager.

Robert W. Stewart, appointed general manager, Consumer Products, **Westinghouse Electric Supply Co.**, Pittsburgh; **Clyde S. Gishel**, appointed president's staff, special assignments.

PERSONNEL



ROBERT F. LAY, elected vice-president and general sales manager, **The Cooper-Bessemer Corp.**, Mount Vernon, Ohio.



R. CONRAD COOPER, elected vice president, administration planning, **U. S. Steel Corp.**, Pittsburgh.



JOHN E. ANGLE, elected vice president, industrial engineering, **U. S. Steel Corp.**, Pittsburgh.



JOHN H. HARRIS, appointed vice president, planning, **Brush Electronics Co.**, Cleveland.

A YEAR AGO nobody believed it!



GOULD & EBERHARDT
21" SHAPER

Installed (without cement, bolts or screws) on AIR-LOC pads that prevent machine from "walking".

Now, over 3,000 presses, lathes, etc. are installed on

Air-Loc
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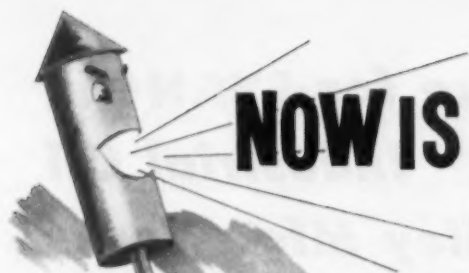
Robert W. Bruins, appointed manager, handler sales, **The Colson Corp.**, Elyria, Ohio.

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AVAILABLE IN 26, 36, 46,
56, 66, AND 76 INCH
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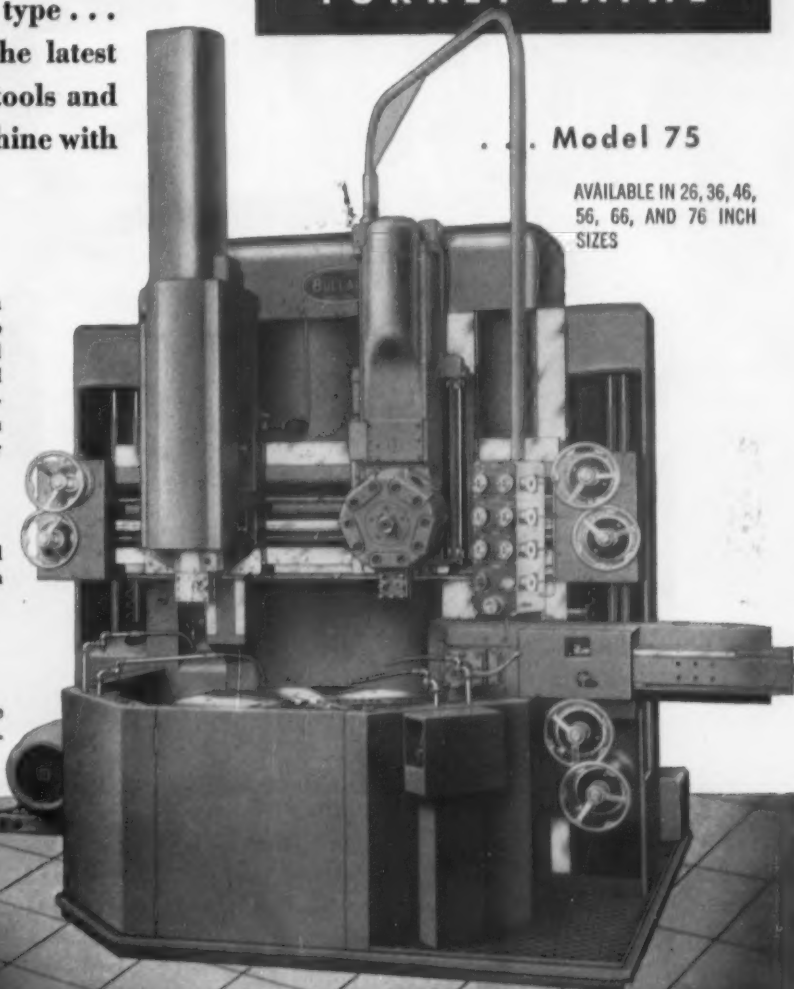
provides maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stopall stick provide safety for both operator and machine.

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**Seven years service for STANOIL
Industrial Oil
at David Bradley Mfg. Works
—No down time for lubrication**



L. R. Cummings (left), Standard lubrication specialist, inspects sample of STANOIL, with Robert C. Menken, Plant Engineer of David Bradley Manufacturing Works. Larry Cummings has been serving industrial customers for Standard Oil since graduation from Standard's Sales Engineering School. His mechanical engineering degree from Tri-State College of Indiana qualified him for this work. Customers of Larry's find this experience and background pay off for them.

David Bradley Tri-Trac, handy piece of farm equipment, gives farmer new opportunity for mechanization at low cost. Upper frame on which gasoline tank is mounted, is part formed in HPM press.

Seven years ago, David Bradley Mfg. Works installed 900 gallons of STANOIL Industrial Oil in an HPM press. There's been no down time required for lubrication maintenance since. A pump by-pass screen filter is the only filtering the oil receives, yet the system continues clean. In March, 1954, an analysis of the oil showed:

Viscosity @ 100°F.—980

Color, NPA — 6

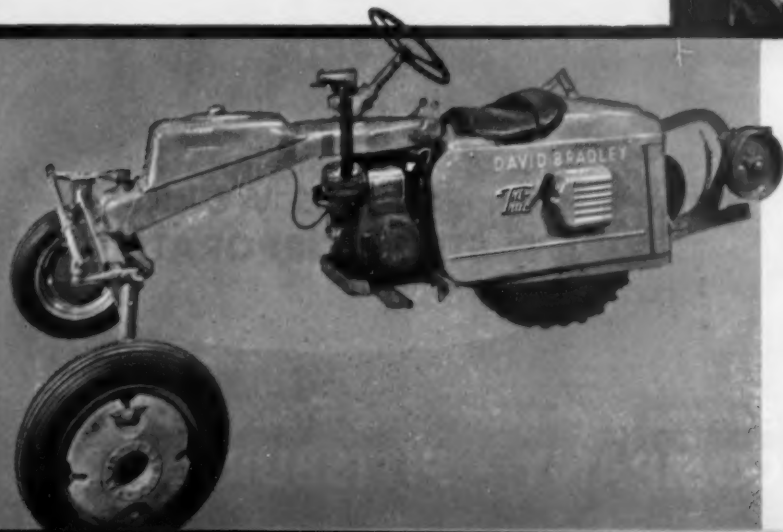
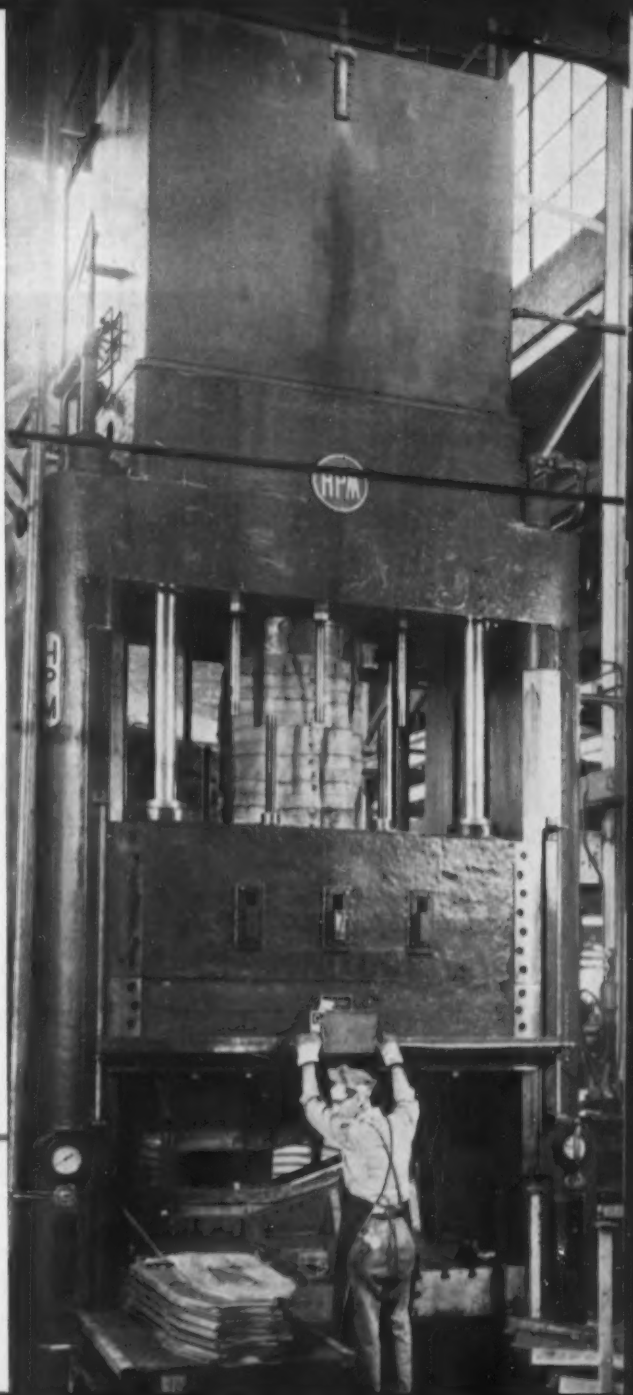
Neutralization No.—.11

STANOIL Industrial Oil has long been at work for Bradley. Successful operations with it in other equipment caused Bradley engineers to specify STANOIL for this installation.

The HPM double acting, fast traverse hydraulic press reported on here is used to draw the upper frames for the David Bradley Tri-Trac, compact farm tractor. The Tri-Trac is the newest implement in the Bradley line. Bradley has been making farm implements since 1832.

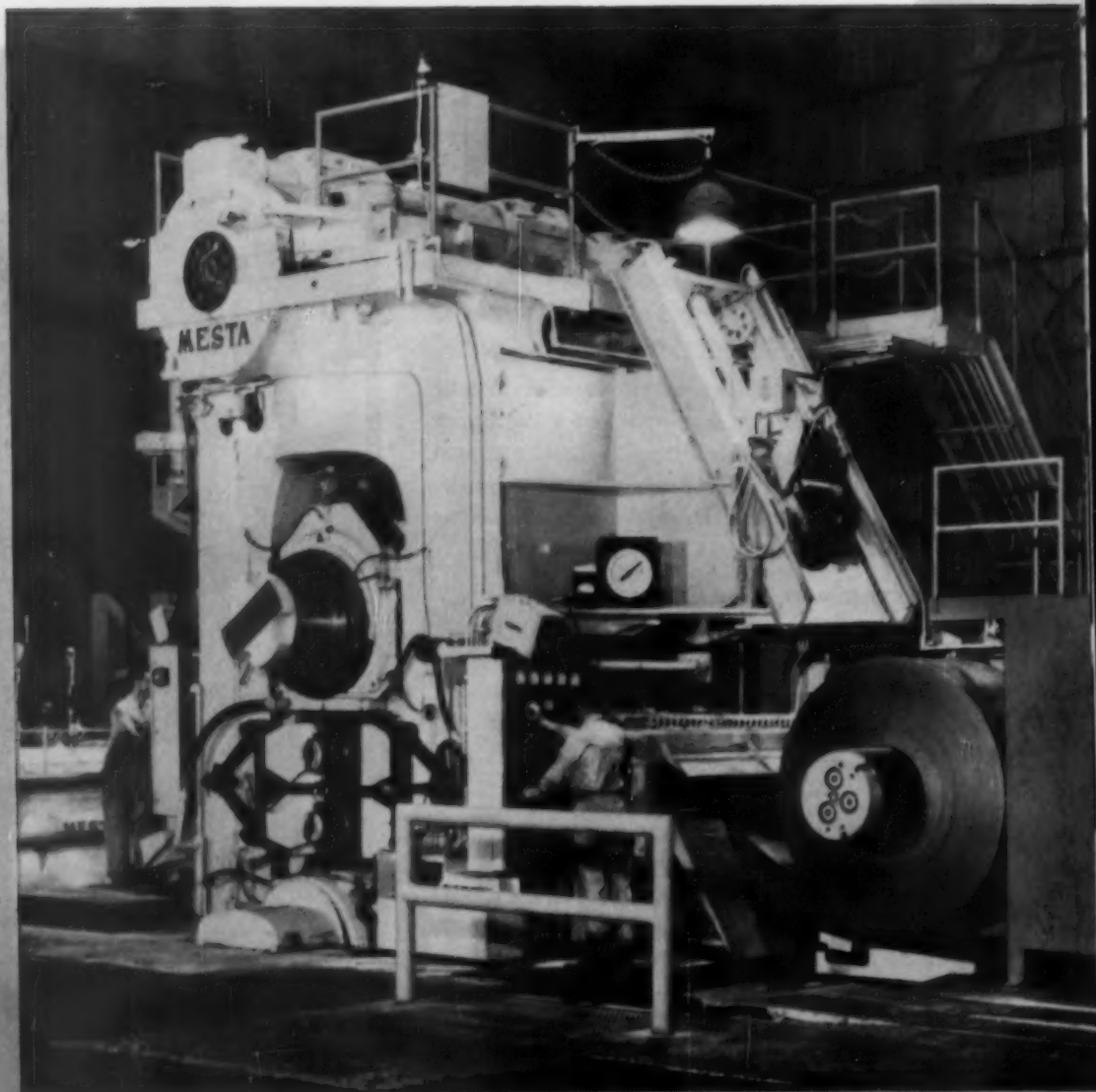
Like to know more about STANOIL? Perhaps it can serve you as efficiently as it is serving David Bradley. Lubrication specialists in any Standard Oil office will be happy to help. In the midwest, a call to one of them will bring a prompt response. Or contact: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

**HPM 500-ton press on the upstroke
after drawing upper frame for David Bradley
Tri-Trac. Hydraulic system remains clean
after 7 years service using STANOIL.**



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High-Speed COLD MILLS



Mesta 80" Four-High, Single-Stand Sheet Temper Mill for Coils

Designed and Built by
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Takes less metal—



EXTRUDED stop light switch housing (right) is formed from the upset blank (left) in a single stroke. Picture sequence was made by using only partial strokes on the extrusion press.

Switch to Cold Forming Cuts Production Costs



♦ It usually takes less metal to cold extrude or coin quality parts than other production methods require . . . Added benefits often include fewer operations, higher strength, better finish, faster production rates.

♦ Expanding use of cold forming techniques is credited to better die design know-how, more efficient die lubrication methods . . . Here's how one small metalworking shop cuts long run production costs by cold forming.

♦ COLD FORMING can now be applied quite readily to certain metal parts that would otherwise require either considerable machining or extensive multiple press operations. This is due to recently developed know-how in die design; also to better die lubrication methods. True, relatively long runs are usually needed to justify tooling and development costs for the cold forming job. But even so, both large and small metalworking shops can undoubtedly make more extensive use of cold forming methods than they do at present.

Braun Engineering Co., Detroit, is an example of a small metalworking shop which does extensive work in cold extrusion and cold coining. During the past five years, this company, employing 50 persons, has tooled for and produced 15 different parts by cold forming methods. In all cases, the selling price of these parts in a highly competitive market has been equal to, and usually less than, the cost of similar parts made by other methods.

According to executives of the company, the

By W. G. PATTON, Engineering Editor

November 17, 1955



BONDERIZED blanks are chute-fed for the rapid cold forming of envelope-type bearings.

primary objective in cold forming is material savings. This, in itself, is often sufficient reason to prefer cold forming over other metal-working processes. However, there may be other benefits such as: (1) fewer operations, (2) higher strength, (3) better surface finish, (4) increased rate of production, (5) increased output per square foot of space, and (6) fewer rejects and failures in service.

The stop-light switch housing shown in the accompanying illustration is an excellent example of a part that is cold formed economically. This part was formerly made on automatic screw machines. The material requirement for the screw machine operation was 250 lb of C-1113 steel per 1000 pieces produced. Finished weight of 1000 parts is only 59 lb. For cold forming, the steel now used is C-1008, and only 65 lb per 1000 parts is required. This represents a savings of 185 lb of steel for every 1000 housings.

The Braun Co. extruded the first samples of this part in March 1952, using 1 in. diam slugs pierced from 5/16 in. plate. The first difficulty encountered was that the metal flowed at a faster rate through the larger corner

orifice than it did through the smaller orifice at the center of the flat section. This was due to the use of a round punch and a hexagonal die which not only created a scalloped top edge but also caused internal breaks in the material.

To overcome this difficulty an inward projection was added to the die cavity at each corner of the hexagon. This can be seen below in the accompanying photo of the finished part.

To do the overall forming job most economically, it was necessary to form the slugs



UPSET switch housing blank (left), extruded housing (center), fully machined part (right).

by cold heading, rather than by a piercing operation. By June, 1953, the first cold headed slugs were produced.

Being part of the hydraulic brake system of the car, exhaustive life tests had to be performed before the extruded switch housings could be accepted for production. These tests were completed in March 1954. Since this time, several million of these parts have been produced.

In addition to holding ± 0.003 in. on the bore and ± 0.001 in. on the shank, the shoulder thickness (relationship of punch to die at bottom of stroke) must be held within ± 0.003 in.

As the first step in the switch housing manufacturing cycle, blanks are formed from 0.562 in. diam steel wire in a standard Waterbury Farrel header at the rate of 160 per minute. Each blow of the header produces a finished slug, which is then annealed.

Following annealing, slugs are Bonderized in a continuous flow in equipment that requires no manual handling. The method used insures adequate and uniform coating with the required die lubricant and phosphate coating.

The coated parts are then extruded in a Bliss 175 ton mechanical press at a rate of 70 per min. As shown in the accompanying sequence photo, forward and backward extrusion occurs simultaneously. The metal flowing back along the punch is permitted to rise to a minimum level around the punch. This is later trimmed to required dimensions. Thus, any inaccuracy in the blank is allowed to escape along the punch. Wall thickness of the part is 0.050 in.

The first secondary operation includes drilling, turning and chamfering. These operations are performed on a single, self-loading machine. A standard Waterbury-Farrel thread roller is used to roll the dry-seal threads.

Upsetting reveals seams

Surface seams in the steel wire are a problem in making these switch housings; however they show up plainly in the upsetting operation that produces the slugs for extrusion. Thus, defective slugs are easily eliminated.

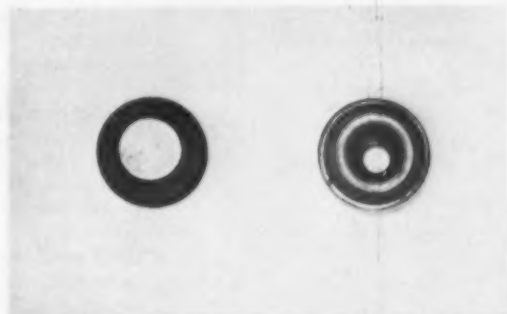
Although cold extrusion produces a strong housing, each stop light switch must still pass a pressure test to insure that it will work when pressure is applied to the braking system of an automobile. Reject rate from this test has been reduced substantially since the housings have been cold formed.

An example of fewer operations in a cold formed part is the valve guard shown. Incidentally, the total selling price of this particular item is equal to what the previously required form grinding operation alone used to cost.

This valve guard is also an example of a non-symmetrical part produced by cold forming. The blank is formed by centerless grinding



FORM-ground valve guard blank (left), with top and side view of the part after cold forming.



ONE blow cold forms a bearing (right) from the upset, annealed Bonderized blank (left).

SAE 1008 or B-1112 steel wire that has been previously cut to length in a cold header. The centerless form grinding assures uniformity of the blank and also permits the desired distribution of metal during a single forming operation, using modern die lubricants. This part carries limits of 0.001 and 0.0015 in.

Ability to use standard screw stock as well as carbon steels for cold-formed products facilitates any machining operations that may be necessary after cold forming.

The method formerly used to make the valve guard started with steel plate. After blanking, rough coining and trimming, the piece was form-ground to required dimensions.

Based partly on their experience with this part using machined, performed blanks, Braun engineers feel that many pieces now being produced by hot forging—connecting rods, for example—will, in the not-too-distant future, be converted to cold forming with important savings in machining. On this type of cold forming, they assert, the surface has hardly been touched. In their opinion, starting with preformed blanks produced on cold headers or screw machines; many intricate shapes can be cold formed with amazing accuracy.

An example of the excellent surface finish that can be produced by cold forming is a envelope-type bearing which the company has

Cold extrusion is no cure-all. Every job must be judged on its own merits. Here is a list of possible advantages and disadvantages compared with other production methods.		
	Possible Advantages	Possible Disadvantages
Compared with Screw Machine Products	<ol style="list-style-type: none"> 1. Less material used 2. Lower per lb material cost 3. Better finish 4. Greater strength 5. Closer tolerances 	<ol style="list-style-type: none"> 1. Higher labor cost 2. Higher tool cost 3. Less design flexibility
Compared with Hot Forgings	<ol style="list-style-type: none"> 1. Lower manufacturing cost 2. Less material used 3. Lower tool maintenance 4. Closer tolerances 	<ol style="list-style-type: none"> 1. Higher per lb material cost 2. Higher initial cost 3. Less design flexibility
Compared with Powdered Metal Shapes	<ol style="list-style-type: none"> 1. Lower per lb material cost 2. Better finish 3. Greater strength 	<ol style="list-style-type: none"> 1. Higher tool cost 2. Less design flexibility
Compared with Ferrous Castings	<ol style="list-style-type: none"> 1. Lower manufacturing cost 2. Less material used 3. Better finish 4. Greater strength 5. Closer tolerances 	<ol style="list-style-type: none"> 1. Higher per lb material cost 2. Higher tool cost 3. Less design flexibility
Compared with Die Castings	<ol style="list-style-type: none"> 1. Lower per lb material cost 2. Better finish 3. Greater strength 4. Closer tolerances 	<ol style="list-style-type: none"> 1. Higher tool cost 2. Less design flexibility

Compiled by: Braun Engineering Co., Detroit

cold-extruded by the million. These parts are used in the steering drag link of a passenger auto, and up to eight of them may be required per car.

The bearings were formerly made on automatic screw machines, but the machining involved a substantial loss in material and also made it difficult to obtain the necessary surface finish.

Several years ago, the process was changed to cold coining, leaving a flash to be trimmed. The part is now made by upsetting the slug on the header, then annealing and Bonderizing it. The blank is then chute-fed to the extrusion press which is a standard 250 ton Bliss mechanical press.

The sole responsibility of the press operator is to keep the chute filled with blanks. Loading and unloading of the die cavity is completely automatic. The extrusion is formed in a single blow at a rate of 56 parts per minute.

Tolerance on this job is tight. In addition to accuracy within 0.002 in., any roughness on the surface of the tools is quickly reflected in the bearing surface. Secondary operations consist of notching and piercing.

Braun engineers believe the limitations of cold forming as a metalworking process are not yet well established, and that considerable experimental work is necessary to design

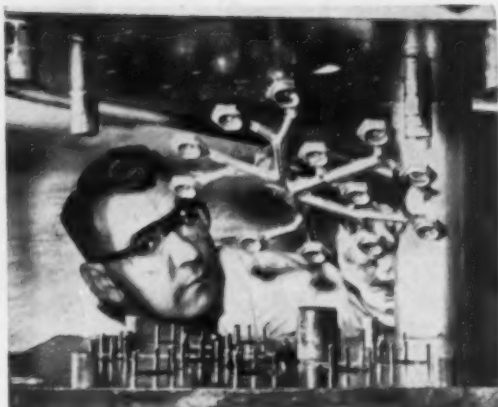
proper tools. However, in their opinion, a steady accumulation of know-how will greatly shorten the period required.

Investment costs for cold forming are relatively high. Good presses are required and cold heading equipment is needed for volume jobs. If automatic feeding of presses is justified, this will also result in a substantial investment. However, Braun's policy has been to delay design of fully automatic material handling equipment until a job is running and the tooling is proved satisfactory.

Experience with cold forming indicates that one of the most important considerations is uniformity of blanks. While shearing in a press will sometimes provide satisfactory blank quality, production rates are much lower than would be possible using a cold header, according to the Detroit firm's engineers. Weight of the blanks must be held within a fraction of an ounce, particularly where closed dies are used. A somewhat larger weight tolerance is permissible if open end dies are used.

By working out the economical technique of obtaining blanks from cold headers this company has overcome its biggest stumbling block—price. Depending on the job, the selling price of its extruded products ranges from \$15 to \$50 per thousand.

Beryllium-Copper, Water Cooling Prolong Plunger Life



BERYLLIUM-COPPER plunger tip, installed in this 450-ton diecaster, operates at 150 to 160 cycles per hour over long periods.



CHAMBER is filled with molten aluminum, then water-cooled plunger lunges forward through sleeve to form 20-oz shot of locknuts.

♦ **CLOSELY** maintained tolerances between the plunger tip and sleeve of an aluminum diecasting machine have stretched the life of these hard-working parts considerably. Two factors account for this longer service: Use of beryllium copper for the plunger tips and water cooling, both of which dissipate the heat rapidly. As a result, the tips have already exceeded a half million cycles and are still in good condition—enough service to have worn out 70 such tips of the previously used material.

Cooling rate reduced

The machine, a 450-ton cold chamber type installed at Ohio Die Casting Co., Columbus, Ohio, casts molten aluminum at 1200°F into a die in 20-oz shots. The 2-in. beryllium-copper plunger tip operates at 150 to 160 cycles an hour in a sleeve with only a 0.0005-in. clearance.

When a plunger tip is first placed in use, water circulation is set to the highest possible rate. As the tip wears, the cooling rate is gradually reduced so that heat expansion maintains a constant clearance. At no time has the plunger tip stuck, despite the close tolerance.

Tips of other alloys need 0.001-in. clearance in this service to avoid sticking.

The beryllium-copper tips, supplied by The Beryllium Corp., Reading, Pa., were installed to provide adequate heat dissipation. In addition, the alloy has tensile strength, endurance and wear resistance comparable to that of steel.

The alloy has the ability to stand up under severe operating conditions. Ohio Die Casting operated one beryllium-copper plunger tip throughout an eight-hour shift without water cooling. Under this severe service, the plunger tip worked satisfactorily. It did not stick, scored only slightly, and showed no serious wear. This same plunger later ran up more than 510,000 work cycles without sticking or failing.

As the plunger tip moves in to feed aluminum to the die, the impact tends topeen the tip edges outward against the sleeve. This also helps to preserve the desired clearance.

The tip wears by feathering at the inlet end around the plug. When this feathering becomes excessive, the tip is renewed. Edges are pounded out, and the tip turned down to fit the sleeve within the desired tolerance.



DESIGNED camber can be seen in the girder at left. Operators are fillet welding sections.

For highway bridges—

Rapid Welding Techniques Speed Girder Fabrication

♦ A combination of welding techniques makes fast work of building up heavy steel plate bridge girders . . . Semiautomatic submerged arc welding is supplemented by manual methods using iron powder type electrodes.

♦ Speed of semiautomatic welding with wire feed averages 13 to 14 ipm . . . Where iron powder type electrodes are used, a high current setting of 250 amp permits a welding speed of 14 ipm.

By EDWARD BROCKE,
Works Manager, Elizabeth Iron Works, Union N. J.

♦BUILT-UP GIRDERS for seven wide-span highway bridges in Connecticut are interesting examples of all-welded heavy steel plate construction. In their fabrication, profitable use was made of semiautomatic submerged-arc welding techniques, plus manual welding with high-speed, iron powder type, Jetweld electrodes. Shop fabrication of the girders was handled by the Elizabeth Iron Works, Union, N. J.

The girders are 90 ft long and 4 ft deep, with 18 in. wide upper and lower flange plates. Twenty-four vertical stiffeners, each 8 in. wide, are welded at 90° to the web plate on each side.

The top flange plate is $\frac{3}{4}$ in. thick and on some girders it is a full 90 ft long. On others, it is made of three 30-ft lengths spliced by a single-vee 60° butt weld with $\frac{1}{8}$ -in. land and gap.

Bottom flanges are in five sections. Two 15½-ft long end sections of $\frac{3}{4}$ -in. plate are spliced to 10½-ft lengths of $1\frac{1}{4}$ -in. plate. In turn, the latter are spliced to a 38-ft center section of $1\frac{3}{4}$ -in. plate. These joints are also single-vee 60° butt welds, with the thicker plate beveled off starting $\frac{3}{4}$ -in. back of the weld to make a smooth taper to the thinner plate.

Welds in the flange plates are ground flush where they contact the web. The latter is of 7/16-in. stock in three 30 ft lengths, spliced by a continuous butt weld in a double-bevel joint, only one plate being beveled at 45°, the other, left square.

Make all splice welds first

In assembly, all splice welds are made first. Then the web and top flange are fitted together in a fixture, made essentially of two supporting I-beam rails and two rows of short I-beam posts anchored in concrete, against which the flange plates bear. Weld between the top flange and web is a 5/16-in. double fillet made by the semiautomatic "Squirt" method, using current settings of 400-450 amp dc and 36 arc volts.

In this setup, wire electrode of either 5/64 or 3/32-in. diam is mechanically fed to the welding "gun" and granular flux is deposited from a conical hopper attached to it. The operator simply guides the gun along the joint and the arc is completely enveloped by flux. Flux is easily brushed off after the weld metal has cooled. Welding speed averages 13 to 14 ipm.

Stiffeners are spaced on approximately 4-ft centers but not squarely opposite one another on both sides of the web. Staggering them helps to minimize possible post-welding distortion of the web. Stiffeners are $\frac{5}{8}$ -in. plates and are welded to the web and top flange with a 5/16-in. fillet.

On these joints, the iron powder type electrode used allows a current setting of 250 amp ac for a welding speed of 14 ipm. Specifically, the electrodes were Jetweld 1, furnished by The Lincoln Electric Co., Cleveland, also supplier of the semiautomatic welding equipment and the necessary generators.

Welding procedures and designed stress allowables conformed to specifications of the American Welding Society for welded highway and railway bridges.

The stiffeners are not welded to the bottom flange which is moved into position and held firmly by screwjacks bearing against an I-beam inside the fixture posts. Actually, the girder is not perfectly straight as assembled, being held to a camber of 3 in. off line at the center. The

lower flange plate is welded to the web for its full length by the submerged-arc method, having a 5/16-in. fillet on the $\frac{3}{4}$ - and $1\frac{1}{4}$ -in. sections, and a $\frac{3}{8}$ -in. fillet on the heavier center section.

The girder is boxed off at the ends by $\frac{1}{2}$ -in. plates, manually welded on the outside to the flanges and on the inside to the web by a double 5/16-in. fillet.

An unusual arrangement was devised for convenient handling of the electrode reel, drive case and flux reserve in connection with semiautomatic welding operations on the long girders. It is nothing more than a small dolly with grooved wheels riding on the edges of the two flanges. Easily wheeled along the girder, it permits quick flux refills of welding guns and, at the same time, does not block the work area alongside the girders.

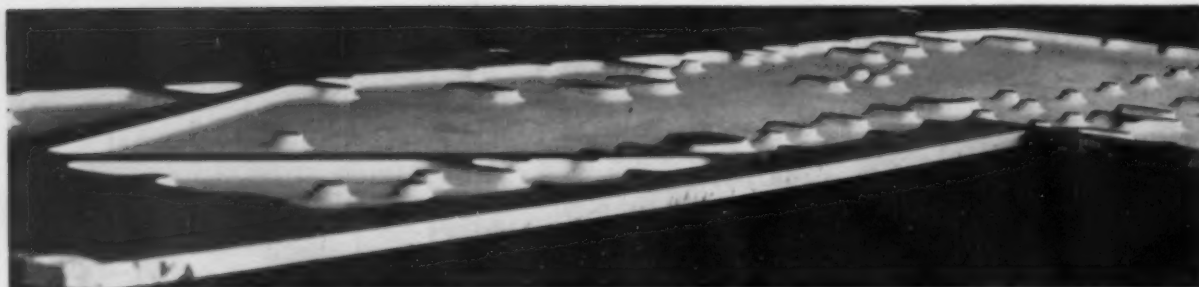
A completed girder weighs approximately 11 tons, and one of the bridges required 14 of them. After erection, they are tied together by welded cross frames of light structurals. Ends of the girders carry heavy-grooved bearing plates 2¼-in. thick, fillet welded all around to the lower flange.

An estimated 860 ft of fillet and butt welding is required on each girder, calling for approximately 335 lb of rod and electrode wire. All plate material conforms to ASTM specification A373 covering structural steel for welding.

After welding and inspection, each girder is given one coat of zinc chromate and iron oxide paint, except on certain specified areas, including the upper surface of the top flange.

Below—DOLLY mounting electrode wire reel, drive and flux reserve is moved along girder flanges.





Aluminum facing section, Chem-Milled to a depth of 0.268 in., within ± 0.003 in., will accommodate a mating honeycomb core structure.

Closer tolerances—

Chemical Milling Leads to Stronger Structures

By R. W. SPENCER and T. F. FREEMAN, Senior Staff Research Engineers,
Materials Research & Process Development Group,
North American Aviation, Inc., Downey, Calif.

◆ SCULPTURING portions of metal airframe sections by chemical rather than mechanical means, to produce complex patterns and reduce airframe weight, is finding wider acceptance throughout the aircraft and allied fields.

Developed by North American Aviation's Materials Research and Development Group, the method is called Chem-Milling. It offers several advantages over methods previously used in fabricating complex aluminum airframe facing sections. Cost is about 25 pct that of machining. Part tolerances can be held as close as ± 0.005 in., as against ± 0.010 in. for machining. And initial investment required is only about seven pct that required for skin milling machinery to do the same job.

In addition, Chem-Milling can be utilized for any complexity or shape of cut, with no impairment to the properties of the parent metal.

Problems raised by postwar demands for lighter, stiffer airframes capable of withstanding the stress of supersonic speeds led to the

◆ Modern supersonic, sandwich-structure airframe designs require exceptionally close fit between core and facing for proper bonding.

◆ A new method for chemically "milling" skin sections permits close control, finer tolerances—and at a fraction of the former cost . . . The technique is finding wider application in aircraft, missile and allied industries.

development of the Chem-Milling technique. Aircraft designers achieved their lighter, stiffer airframes through the adoption of honeycomb sandwich structures, consisting of honeycomb cores bonded, sandwich fashion, between aluminum facing sections. Improved, phenolic-based bonding agents were developed to stand up under the higher temperatures encountered at supersonic speeds. But these, to insure maximum bond area between core and facings, and thus best physical properties, required an exceptionally close fit between core and facings.

Machining of honeycomb sandwich materials to close tolerances had long been a problem in any but plain, flat, unedged paneling. The cells of the honeycomb structure have to be stabilized sufficiently for machining. Various methods were tried, including filling the cells with low melting point lead alloys, ice or thermoplastic resins; boxing the edges of the core log with planed pine or welded steel frame, etc. Of them all, the technique incorporating the thermoplastic resin seemed to hold the most

promise. This was thoroughly investigated to determine the best materials, processes, machinery and cutting speeds, etc., to use in shaping the core structure.

There remained the problem of fabricating the complex facings. This was solved by adoption of the Chem-Milling technique. Metal areas in which the original thickness is to be retained are masked, and material is removed from the remaining surfaces by etching.

A good example of the technique at work is found in the making of one of the package components panels. Design requirements called for a high-strength low-weight structure, to operate at a temperature of approximately 300°F. The critical strength-to-weight ratios involved made the use of honeycomb sandwich fabrication mandatory. And the high heat-resistance requirements dictated the use of one of the phenolic-based structural adhesives.

Mill one face

A study of the design showed that Chem-Milling one face of the panel would help. It would provide not only additional stiffness but also integral edge members and inserts in areas where high local compressive loads were expected. Since previous designs required a costly hand-fitting of each separate aluminum and/or melamine laminate insert and edge member, inclusion of the Chem-Milling operation would be economical. Finally, it would provide a smooth aerodynamic surface such as could not have been realized with conventional construction methods.

In fabrication, a 5/16-in. 24ST aluminum plate was masked and Chem-Milled to a depth of 0.268-in., plus or minus 0.003-in. Outer peripheries were machined to final dimensions.

Number 40 holes were then drilled, normal to the skin edges, at 4 in. intervals. These allow escape of volatile matter during the curing cycle. The 0.020-in. 24ST aluminum opposite face of the sandwich was sheared to oversize dimensions. Together with the Chem-Milled face, it was cleaned in accordance with existing pre-bond techniques.

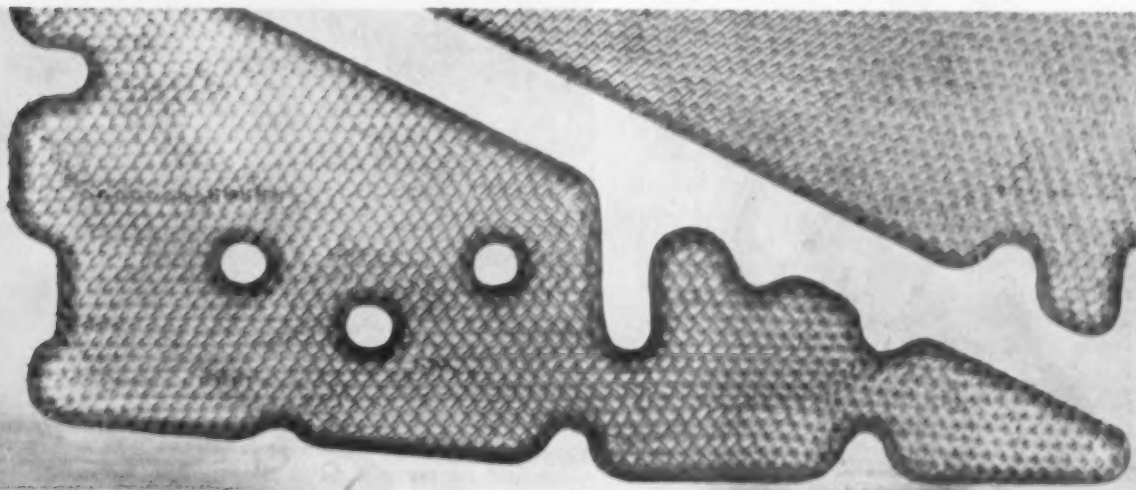
The aluminum honeycomb structure, after preliminary machining to proper thickness, was expanded and filled with thermoplastic epoxy resin. After hardening, the panel was machined by a Keller duplicator which followed exactly a master plaster pattern cast from the Chem-Milled skin plate.

Following machining operations, the epoxy casting resin was melted from the core in an oven. The honeycomb core was then degreased for ½ hour in hot trichloroethylene and soaked for ½ hour in acetone, to further insure against the presence of foreign matter which might affect the core-to-facing bond.

Bonding of the sandwich was accomplished with a high-temperature resistant phenolic-base adhesive in 0.020-in. tape form. The adhesive was heat-pressed into the Chem-Milled skin in such manner as to produce good bonding not only in the normal faying edges but in the many radii as well.

Faces, core and adhesives were then assembled as per drawing requirements and vacuum-bagged in the conventional manner i.e., polyvinyl alcohol film and zinc chromate putty, to a ¼-in. thick aluminum caul or plate under a pressure of 13 psi. Final cure was effected by heating in a 180 F oven for ½ hour, then raising the temperature to 320 F for one hour.

After final curing of the panel, the 0.020-in. skin was routed to final dimensions.



Tracer milled by conventional methods, the completed core nests in the Chem-Milled facing. Flat facing will complete structure.

Saves in the long run—

Precious Metal Plating: Uses Expand in Industry

♦ Precious metal plating, once considered too expensive for industrial use, is rapidly finding its way as a low-cost method of achieving optimum serviceability.

♦ As a group, the precious metals offer high resistance to surface changes . . . Thin deposits of rhodium, for example, resist wear and at the same time retain their surface properties.

By P. J. SLOANE, President,
and ISIDORE CROSS, Secretary-Treasurer,
Harper-Leader, Inc.,
Waterbury, Conn.

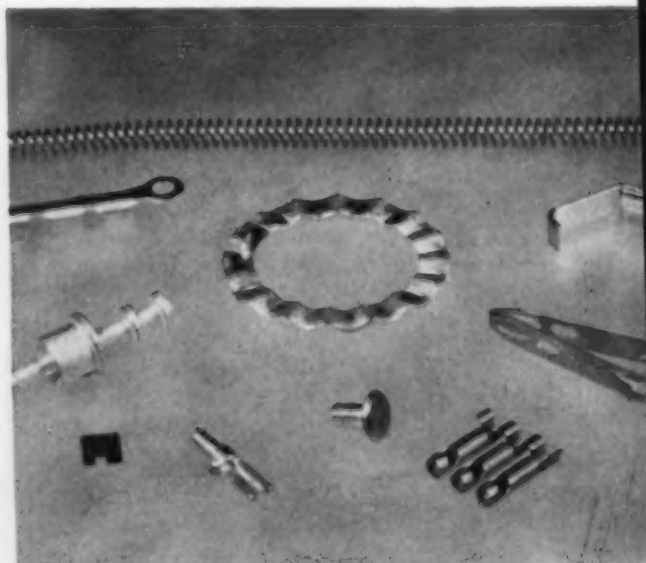


♦ PRECIOUS metal plating, once considered something for the jewelry trade, now holds an important spot industrially. In fact, it's an absolute necessity for parts used under certain service conditions. Spurred by the electronics and aircraft industries, precious metal plating proved to be not expensive in light of the superior performance obtained through its use. Other industries soon saw the benefits to be gained.

As engine temperatures climbed with the development of jets, the bearing and anti-galling characteristics of silver solved some difficult operational problems. For example, many bolts and nuts used to fasten jet engines are made of alloys which seize after several hours of operation making engine disassembly extremely difficult. A silver plate of 0.0001 to 0.0003 in. often solves this problem and makes engine tear-down a simpler matter.

The electronic industry is the volume user of precious metal electroplating. It has stimulated uses for all metals in this category, the more common ones being gold, silver, rhodium, platinum and palladium.

Electronic and electrical components are designed for a particular function such as pressure, tension, torsion or some other force. These components are usually made of a copper or iron alloy for mechanical reasons. As a rule, these base metals do not have the desired electrical properties, particularly for high frequency, low current applications in-



Above—ELECTRONIC components serve as a major field for precious metal plating. These are only a few which require very specific properties.

Left—SILVER-PLATED fasteners for jet engines overcome seizing and galling problems, simplifying the work of tearing down the engine.

volving contact surfaces. By plating such parts with precious metals, singly or in combination, the desired properties are attained, thus achieving low-cost solutions to otherwise difficult problems.

Similar principles apply to bearing surfaces. Fatigue resistance in bearings could be raised using a strong backing material with a relatively thin coating of a suitable bearing material. Silver-overlaid bearings are electroplated to thicknesses up to 0.060 in. and then machined to final dimensions. Often, the bearing surface is honed and micro-finished.

Aids microwave transmission

Precious metal plating also plays an important role in making microwave equipment. While some intricately designed components are electroformed of copper, then silver and gold plated, most wave guides are made of copper and brass parts. Since microwave transmission is a skin phenomenon, a skin of silver is plated onto the assembly. Being made of different alloys having different resistances, then silver brazed or soldered together, silver plating of the complete unit gives the wave guide the uniform conductivity required. Very often a thin plate of gold or rhodium over the silver protects it against tarnishing.

Industrial plating, whether precious metals are involved or not, is a complex operation. With precious metals, skill and scientific know-how take on added importance because a mis-

take becomes quite costly. Each thickness of plate is intended to do a specific job. To put on more plate than necessary is wasteful. To put on less may be just as wasteful because a specific performance requirement would not be met.

Plating threaded parts with Class II fits or better is one instance where many mistakes are made. Plating adds metal to the part. A specification of 0.0003-in. plating thickness adds 0.0006 in. to the diameter and about 0.0012 in. to the pitch diameter of a threaded part. The part to be plated must be machined down to take the specified plating thickness if the finished dimensions are to be accurate.

Use of dial gages is almost essential in this type of plating and assures a minimum of reworking. This problem is so acute that one large maker of electronic equipment considered using screws of stainless steel or anodized aluminum. However, this solution is not a practical one in the jet engine industry where the high-alloy stainless steels must be coated with silver to prevent galling.

The constancy of electrical properties of these metals is probably their one distinguishing characteristic. Although platinum and palladium are poor conductors compared with copper, aluminum, beryllium copper or nickel, none of the platinum family of metals will oxidize at the high operating temperatures of some electrical equipment, whereas the baser metals will. Oxides of copper, nickel and aluminum are extremely poor conductors. Silver forms a sulphide film, the familiar tarnish, but this film is soft and also quite conductive compared with the oxides of these other metals.

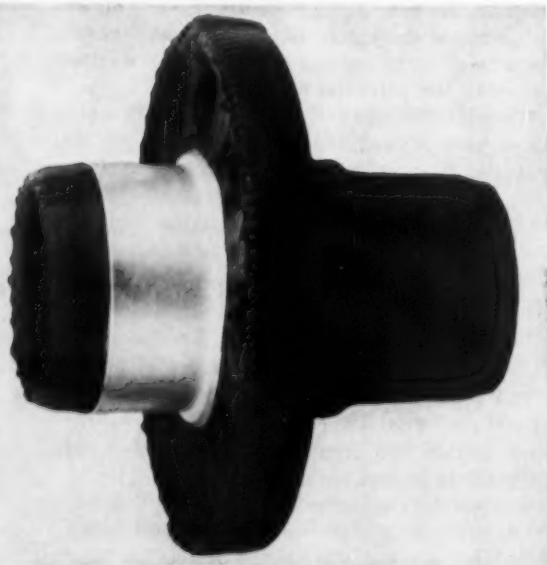
Precious metals are generally soft in their wrought, unalloyed state. In terms of Vickers hardness numbers, they range between 25 for silver to 39 for platinum and palladium. Rhodium is an exception, having a value of 120 Vhn.

Metal hardness increases

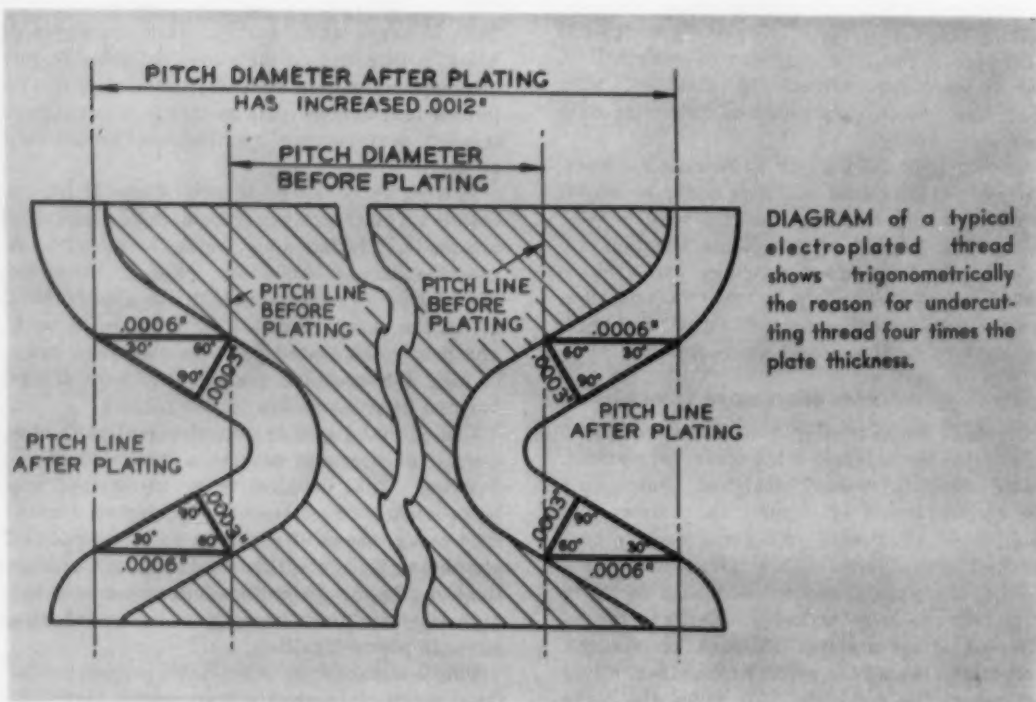
The hardness numbers for these metals, electrodeposited, are considerably higher than in the wrought, annealed state. Silver, when plated, may have a hardness of over 100 as compared with 25 in the annealed state. Rhodium, electrodeposited, has a hardness number of about 800, which is in range between nickel and chromium. Because of this hardness, rhodium is being used more extensively where wear resistance is a factor.

Values in physical properties of metals, such as resistivities and hardnesses, will vary due to differences in plating conditions. Many of these conditions can be and are controlled. A bright deposit is often harder than a dull deposit of the same metal. Its resistivity may also be higher.

Various addition agents are used in plating



THIN COATINGS of silver on bearing surfaces such as this one often increase fatigue resistance of a part. This coating is 0.040 in.



solutions to refine the grain structure of a particular deposit. These agents often plate out with the metal being deposited, forming a slight alloy, and altering the properties of the plate somewhat.

The amounts of the addition agents co-deposited are usually so small that the basic properties of the plated metal are not altered to any great extent. It is also feasible to deposit pure metals where performance requires it. Hydrogen is also co-deposited with metals, particularly in plating solutions operated at less than 100 pct efficiency such as chromium, rhodium, brass and zinc.

Silver, which normally plates at 100 pct efficiency, does not deposit with hydrogen since no hydrogen makes for a stressed deposit. This is probably due to interference with crystal growth. These deposits are hard and brittle. Electrodeposited rhodium serves as an example, but in this case the hardness is actually advantageous. Stressed deposits of rhodium invariably contain microscopic cracks which in no way interfere with its use as a hard contact surface of low resistance and unchanging electrical properties.

Precious metals are commonly used for anti-tarnish purposes, as for example gold or rhodium over silver. This is not the same kind of protection that zinc or cadmium give to steel. In fact, a light plate of any precious metal will actually accelerate corrosion of the underlying metal. In one case, rhodium was plated on steel to withstand 100 hours in the

standard salt fog cabinet. Even though as much as 0.002 in. of nickel was plated under the rhodium, the piece failed badly.

The reason for this phenomenon is that two dissimilar metals in contact with one another set up a cell. The more electronegative metal becomes the anode. The anode dissolves; the cathode doesn't. Since it is usually the underlying metal that is to be saved, consideration must be given to makeup of the cell and ways of reducing the potential differences.

To minimize any cell effect, the plated metal must have almost the same potential as the material it is protecting. In the case of iron, zinc has an electrolytic potential of -0.76 v and is anodic to and will protect the underlying iron which has a potential of -0.44 v. Cadmium, with a potential of -0.40 v, also affords good protection because it is only slightly more electropositive than iron.

Tarnishing has useful effect

The potential of gold is $+1.36$ and that of silver $+0.8$. The difference between either of these metals and iron is extremely large. If the plate is porous, as a thin plate usually is, it will accelerate corrosion of the base metal. Thus, precious metals which will not tarnish or oxidize are not useful for protecting base metals against corrosion. If the plate is built up to overcome the inherent porosity of thin coatings, costs become prohibitive in most cases.

Among the precious metals, silver is the most common. It is by far the least expensive, least

rare and its use in electronics and as a non-galling, anti-friction surface is most widespread. It is the best conductor of all metals and finds much use where currents and voltages are not too low. It is particularly useful where slight rubbing is normal and the wiping action removes the tarnish film.

The silver sulphide film possesses rectifying properties, and where small currents are used, an error of some magnitude may appear because of signal distortion. Where conductivity is essential and tarnishing a deterrent, a thin plate (about 0.00001 in. or less) of rhodium over the silver protects it against tarnishing. Thin gold electrodeposits also serve the same purpose. In addition, gold provides higher surface conductivity than rhodium.

Another important property of silver is its low solubility in iron. At the high temperatures at which the jet engines perform, that is of utmost importance.

Use of silver as a bearing surface material is still growing. In the textile knitting industry, especially with the newer synthetics, high speeds are essential for economical operation. In one case a small shaft is made of stainless steel for its non-corrosive properties. The cylindrical part in which the stainless shaft rotates is an oil-impregnated powder metal bearing. The shaft, spinning at 3100 rpm with a 2-gr pull, gummed the oil with which the bearing was impregnated. The assembly, being part of a tension control, seriously hindered operation of the mechanism.

Silver of less than 0.0001 in. was then plated on the stainless shaft. Not only did it eliminate drag, but the thin deposit was still intact five months later.

Gold resists chemical attack

Gold is another of the precious metals to find wider industrial utilization. Its conductivity is about 75 pct that of copper. It does not oxidize at any temperature up to its melting point in normal atmospheres. Most chemicals will not attack it. One of its uses is for surfaces requiring low contact resistance. In some cases, it is applied in a thin plate over silver where the high conductivity of silver is necessary but hardness is not important. Such applications are common in marine atmospheres. Being a soft metal, it burnishes and wears readily.

Until recent years, gold had not been plated to any appreciable thickness. The electronics industry gave impetus to further research in heavier gold deposits with excellent results. Now, bright plates are used especially where thermosetting plastics are molded around the plated contacts. It is easier to remove flash from a bright plate than from the conventional dull plate.

Gold exhibits high reflectivity in the red and

infra-red ranges. For that reason, it is used to surface reflectors and instruments that work in the infra-red range.

Much of the work on precious metals in recent years has been with rhodium. It has most of the properties of platinum, and exceeds it in corrosion resistance, yet is only half as dense. Parts plated with it are excellent for contact surfaces requiring a low stable resistance because they remain completely free of surface films. This is of utmost importance for currents of no appreciable voltage.

Inertness of rhodium an asset

Rhodium deposits are extremely hard. This property gives it increasing usefulness as a surface for sliding contacts. A slight polishing takes place on rubbing a rhodium surface, but there is no appreciable wear. Rhodium is practically inert in its chemical properties. It is resistant to all the common acids including hot aqua regia, which dissolves platinum.

It resists highly adverse atmospheric conditions which accounts for its widespread use as a coating over silver in radio frequency apparatus and in printed circuitry. Light rhodium plating to about 0.000005 to 0.000015 in. is usually sufficient. Such a thin rhodium deposit in no way destroys the beneficial properties of the underlying silver.

Rhodium deposits up to 0.00005 in. thick are porous. A heavier plate (between 0.0001 to 0.002 in.) will show stressed crack patterns due to co-deposition of hydrogen. Heavy deposits of rhodium are milky white in appearance, whereas the thin deposits are brilliant. Aside from appearance, these frosty coatings have no higher resistivity than bright deposits and are equal in all other respects.

Rhodium plating solutions have fairly good throwing power. Intricate shapes can be covered on all surfaces without the necessity for specially designed and costly plating fixtures.

Platinum and palladium have very similar properties. Rhodium has displaced platinum to a large extent, particularly as a decorative plate. Plating from platinum solutions is difficult. Also, since there are few calls for its use in the electroplated state, very few firms have had production experience with it. However, it has excellent corrosion resistance at all temperatures, and for this reason is used on connectors where extremely high temperatures are necessary. Rhodium has largely replaced palladium as a tarnish-resistant coating over silver.

BIBLIOGRAPHY

1. *Electroplating & Metal Finishing*, v. 8, No. 6, June, 1955, p. 234.—2. H. J. Wiesner, *Proc. AES*, 1952.—3. Private work by authors at Harper-Leader, Inc.—4. Brochure from Sigmund Cohn, Inc.

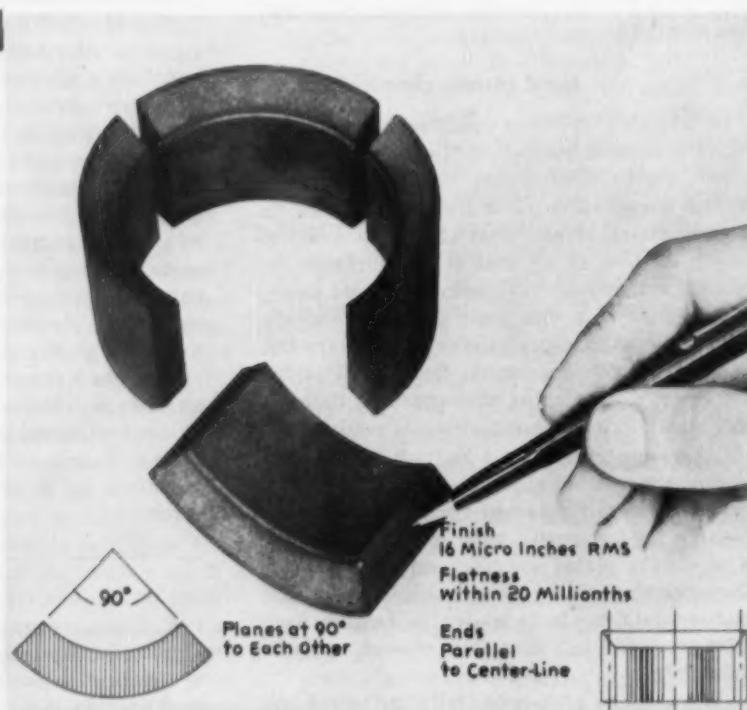
Flat to 20 millionths—

High-Speed Machine Grinds Sintered Parts to Extreme Accuracy

♦ High grinding accuracy on the segments of a four-piece deflection yoke for color TV tubes is the bottleneck in a mass production line . . . Such was the case at RCA . . . With a special machine, parts are now ground to a 16-microinch finish at the rate of one every three seconds.

♦ High-grinding accuracy on the segments of a four-piece deflection yoke for color TV tubes is a must to obtain the proper magnetic field . . . Mating segments are ground to a flatness within 20 millionths of an inch.

FOUR-PIECE deflection yoke for color TV tube must be ground on mating surfaces with extreme precision to obtain proper magnetic field.



♦ **IMPROVED** grinding equipment now permits faster production of small sintered parts with surface finishes down to 16 microinches. Key to the high-speed operation is a three-station, electro-hydraulic grinder with automatic down-feed and accuracy to 0.0002 in.

At present, the technique is used primarily in the television industry, where precision grinding of some TV components is essential. But similar techniques are adaptable for use by manufacturers of other precision equipment.

The problem of finish grinding sintered parts lies in the hard and brittle nature of the rough metal. It does not lend itself easily to the deep first cut often necessary in mass production. In addition, distortion of the parts occurs in the sintering furnace, which makes it almost impossible to calculate accurately the depth of the first cut.

Imparts desired characteristics

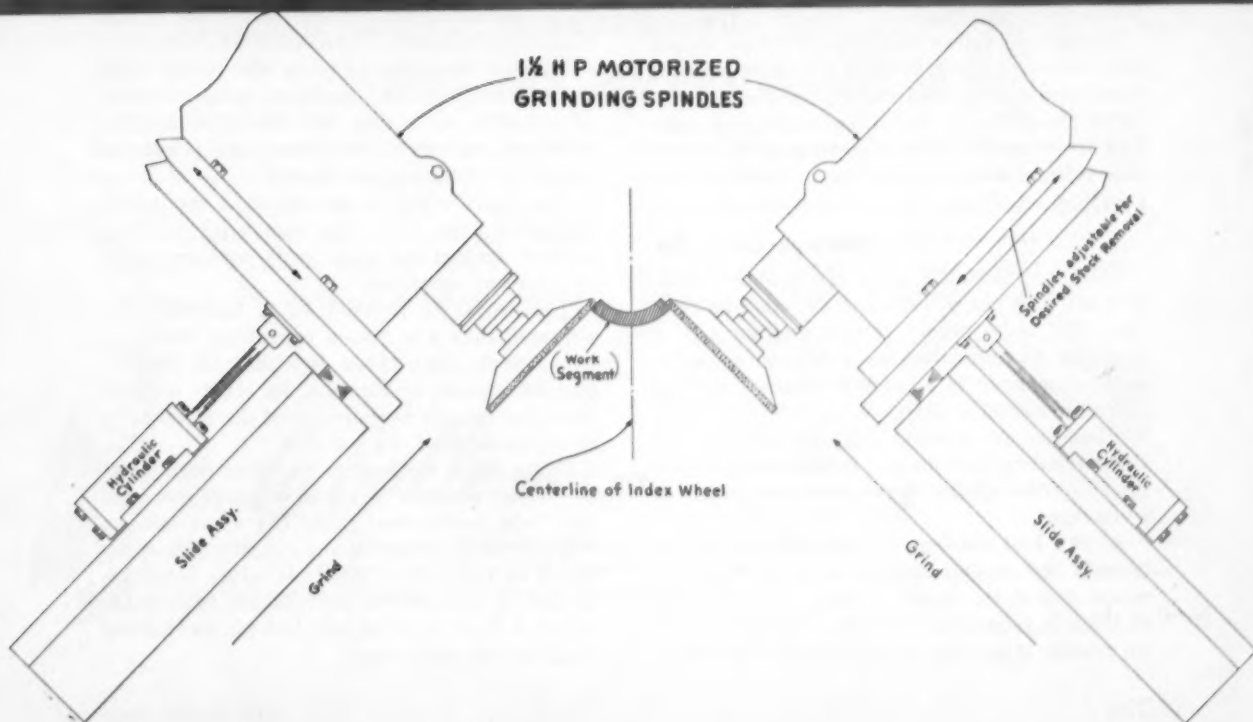
Use of sintered metal components in electrical equipment involves special problems—that of finishing ferrite-type pressings, and grinding them to provide desired electrical characteristics. Design engineers at RCA, working in conjunction with The DoAll Co., have developed precision surface grinding equipment as an answer to these problems.

The equipment finishes each of four segments



Below: **DIAGRAM** shows how paired grinding heads move with respect to workpiece. Hydraulic cylinders actuate heads on grind and return strokes.

Above: **TV COMPONENTS** are mounted on the periphery of a 48-in. wheel of this machine, then indexed in an arc through three grinding stations.



"Once in operation, finished work pieces drop to a conveyor at three-second intervals . . ."

which mate to form a cylindrical deflection yoke. The yoke is later wound to form a coil which is mounted on the neck of a color television picture tube. The eight abutting surfaces between the four segments must be accurately finished to produce an exact cylinder with the proper magnetic field.

In operation, the grinding equipment:

(1) Automatically loads, aligns, grinds and discharges each part.

(2) Automatically takes each segment down to the desired dimension, finish and flatness in three successive grinds.

(3) Simultaneously grinds both segment ends; maintains the planes of the ground ends at 90° relative to each other within 50 micro-inches over the 7/8-in. width.

(4) Finishes each piece to 16 microinches rms and flat within 20 millionths across the entire surface.

(5) Once in operation, finished work pieces drop to a conveyor at three-second intervals.

Segments are stacked in a vertical hopper, ends facing out from the machine. A hydraulic loader on the hopper base pushes the lowest segment into a fixture, one of 36 mounted on the periphery of a 48-in. index wheel. After a segment is seated, a lever is hydraulically-actuated, causing the fixture to clamp the segment.

The work-holding wheel then indexes 10°, moving the loaded fixture toward the first pair of grinding spindles. The following fixture then moves up for loading.

Workpieces are carried through three grinding stations. At each station, the index wheel is positioned by a hydraulically-actuated lock pin. After the wheel is locked, twin grinding spindles move across the segment faces. The spindles ride on hand-scraped ways. Diamond, cup grinding wheels are used on all three cuts.

Three passes to size

After completing a pass, the grinding spindles and lock pin withdraw to the starting position. The index wheel rotates another 10° to bring up an unfinished piece. The loader seats another segment in an empty fixture, while the spindles advance again on a grinding pass. Workpieces are carried past the second and third grinding stations and to the final position. An automatic ejector drops completed pieces to a conveyor.

At the first station, all but 0.035 in. is removed; the second station removes 0.025 in. more; and at the third station a final 0.010 in. of stock is ground to bring the segment to size. An extremely smooth surface results, one which

is flat and square to 20 millionths of an inch.

To generate the micro-finishes and maintain tight dimensional control, adequate dampening, rigidity and stability are essential. This is achieved with balanced and reinforced grinder design.

An electro-hydraulic mechanism provides automatic downfeed accurate to 0.0002 in. It is also used to index the work-holding wheel. Mass, rigidity and positive locking of the index wheel before a grinding pass contribute to the highly accurate finishes possible with the machine.

Spindle columns are hand scraped to fit the heavy column ways. Both fixed and sliding members of the spindle-actuating assembly are cast from a stable, long-wearing nickel-chrome alloy.

Grinding spindles are powered by 1½ hp motors. Spindle bearings are tapered and preloaded with a maximum runout less than 0.0002 in. on the spindle nose. The bearings are designed for continuous operation, with permanent lubricant and special oil seals. Lubrication of the sliding ways is controlled automatically by a metering system.

Spring locks part

Workpieces are ground under a flood of coolant. Hydraulic or electrical locking of holding fixtures is thus impractical.

Segments are held to the index wheel by a lever-actuated spring clamp. Actual locking is accomplished by a leaf spring to which are attached hardened fingers, contacting the tapered lip of the segment. A simple link and wedge system clamps the spring-mounted fingers against the piece. The hydraulic loader acts on an arm to lock the spring. A second arm pushes the locking wedge back at the unloading cycle. A compensating adjustment takes care of size variations between runs of sintered parts.

Fixture mounting pads on the index wheel are of hardened steel, machined to an accuracy of +0.0015 in. across the diameter. Lockpin bushings on the index wheel are positioned within 0.002 in. of true center.

The index wheel is carried on a steel shaft having a 5-in. diam. Tapered roller bearings protect against the axial loads encountered in this type of operation.

The wheel is indexed by a hydraulically-actuated rack and pinion operating through a cone clutch. Rack throw is adjustable for precise increments of rotation. Its stroke is cushioned for smooth deceleration of the wheel prior to engagement of the lock pin.

In its index motion, the locating bushing of the wheel meets a lock pin which is extended and held hydraulically. At the same time, a cylinder presses against the opposite side of the wheel to support it. This minimizes deflection caused by pressure of the lock pin against the wheel. A short taper on both lock pin and mating bushing help centering.



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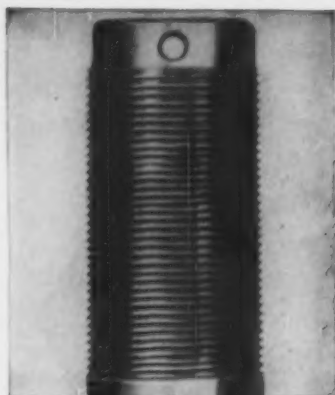
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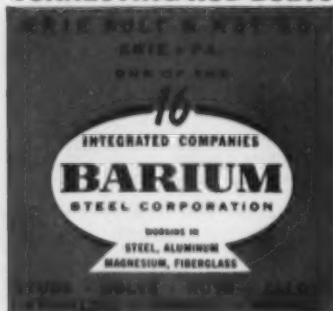
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New Technical Literature:

Catalogs and Bulletins

Beryllium directory

A 20-page directory lists and describes the characteristics of a company line of beryllium copper, beryllium aluminum and beryllium nickel alloys, beryllium metal and beryllium oxide, wrought, forged and cast beryllium copper alloys, and beryllium copper safety tools. The directory announces the availability of both extruded rod and bar stock, as well as seamless beryllium copper tubing in redraw sizes and extruded shapes. *The Beryllium Corp.*

For free copy circle No. 1 on postcard, p. 133

Materials handling

A 28-page brochure describes line of steel wire mesh Cargotainers, pallets and bulkheads designed for materials handling operations. Photographs illustrating actual case histories from small, medium and large industrial concerns are included. *Pittsburgh Steel Products Co.*

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Oscillographic recordings

Oscillographic recording systems, components and associated equipment are fully described in a new 16-page illustrated catalog. The company's basic "150" systems, in 1, 2, 4, 6 and 8-channel models, as well as the 11 currently available plug-in preamplifiers are discussed in detail. Performance data is given for these interchangeable front-ends, as well as frequency response characteristics of galvanometer with driver amplifier. *Sanborn Co.*

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Machining high speed steel

A new data sheet now being distributed gives detailed information on high speed steel of the molybdenum-tungsten type. *Allegheny Ludlum Steel Corp.*

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FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 133.

Centralized lubrication

Centralized systems of lubrication are described in a new 20-page booklet detailing a mechanical method of dispensing oil or grease under pressure to a group of bearings from one central station in exact measured quantities as often as desired. Booklet includes a description of the principle of operation of the system's measuring valves. Listed are the types of pumps, valves, fittings and accessories available. Also featured are the company's self-contained spray valve panels which can be fastened to gear housings or framework to spray lubricant directly to the pressure side of gear teeth. *The Farval Corp.*

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Mobile power unit

"Now . . . AC Power Goes Anywhere a Vehicle Can Go" is title of 8-page brochure describing a new ac mobile power unit. The units are used principally for auxiliary lighting and for driving power tools and machinery located away from power lines or during periods of power failure. These Mo-bil-ac units, the maker states, supply up to 10 kw at standard voltages and frequencies, yet are small enough to be mounted under the hood of a car or truck. Brochure illustrates the equipment and shows its uses on typical applications. *Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co.*

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FREE TECHNICAL LITERATURE

Time delay relays

Selection information for time delay relay models is contained in a 4-page bulletin. Chart in the bulletin to select the correct model for a particular time delay or combination of time delays in an electrical circuit. Chart gives method of adjustment, operating voltage, type of operation, contact arrangement, type of contact, dimensions and weight for each model. Various mountings and enclosures are shown in six diagrams. *A'G'A Div., Elastic Stop Nut Corp. of America.*

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Electro-pneumatic controllers

A data sheet describes electro-pneumatic controllers of the current-adjusting type, with a discussion of how control combines the features of pneumatic control with an electrical system. Included in the sheet are: full description with line drawings and photographs of the controller and its associated converter; specifications and standard ranges of models and equipment needed for a complete control system. *Leeds & Northrup Co.*

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Drilling machines

Drilling machines are described and illustrated in a catalog now available. Equipments covered include a deluxe model equipped with a boring head and designed for precision locating, drilling, reaming and boring of materials up to 36-in. wide. Also discussed is the Scan-A-Scale visual gaging system with built-in microscopes, illumination and mirrors, which facilitates fast location of holes. *Wales-Strippit Corp.*

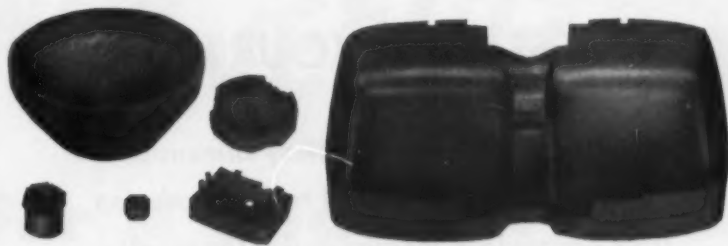
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Forgings

"What Is a Forging?" is a new 8-page booklet describing how the forging idea originated and grew, how forgings are made, and the important part forgings play in everyday products. Pictures and drawings are provided. *Drop Forging Assn.*

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You can trim drawn shells like these in a single press stroke!

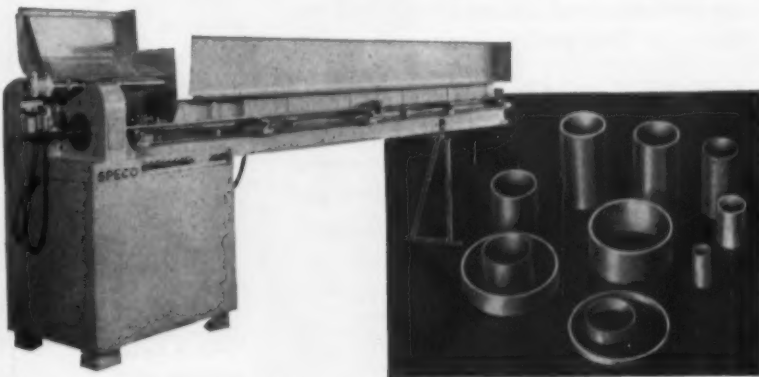


The Brehm "Shimmy" Die employs a radically new trimming principle . . . completely different from ordinary trimming methods. A cam action inside the die moves the shearing edges four ways—eliminating slow, costly "horn" and "pinch" trimming operations. You get a perfect edge finish every time . . . and a single die may be used for many different shapes. Production goes up fast. Production costs are slashed! Trims stainless and

mild steel, copper, brass, zinc, aluminum, gold, silver, fiber, rubber, plastics. Trims all sizes from fountain pen ferrules to refrigerator doors—in almost any thickness that can be drawn. Brehm Dies can be used in mechanical or hydraulic presses.

The NEW Brehm Trimming Press does all trimming in one press stroke . . . takes less power, trims shells up to 16 inches square, 6 inches deep, .125 inch stock—metals, plastics or fibers.

Up to 10,000 pieces in 86 minutes with the new Brehm tube cutter!



The revolutionary Brehm Tube Cutter has a cutting action that makes it the finest machine of its kind ever built! Cuts tubes $\frac{3}{8}$ " to $2\frac{1}{4}$ " O.D.—with production speeds ranging up to almost 7,000 pieces per hour! With the Brehm shearing action, there is no loss of stock—no burred tube ends! Up to 25% more pieces from the same length of stock. Cuts almost any tubing—mild steel, stainless steel, brass, copper, aluminum, etc.



→
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COUPON
TODAY**

Steel Products Engineering Company
Dept. 34, 1205 W. Columbia St., Springfield, Ohio

PLEASE SEND FREE LITERATURE ON:
☐ BREHM TRIMMING DIE
☐ BREHM TRIMMING PRESS
☐ BREHM TUBE CUTTER

NAME _____ TITLE _____

COMPANY _____

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CITY _____ ZONE _____ STATE _____

WHICH GAGE IS BEST FOR YOUR JOB?

● **Before you buy your next dimensional gage, ask for an unbiased recommendation from a manufacturer who makes the greatest variety of ALL KINDS of gages and plays NO FAVORITES.**

Let's be honest! Any one of several kinds of gages can be applied to a dimensional control problem. But only *one* can be economically justified. For example, an air gage is all too frequently purchased for jobs where a dial indicating gage is sufficiently accurate and fast and will serve at half the price. When are extreme speed and accuracy worth the extra cost? Your profits depend on the answer.

Federal can afford to give you an honest answer. We know the economics of all kinds of gages because we make such a wide variety, as you can see in the column at the right. Whatever we recommend, we have a chance for a sale. So, why play favorites? Using this unbiased approach, our engineers make unhedged recommendations of the best gage for any job.

It pays to compare recommendations. Why not adopt this buying policy? Ask Federal first for unbiased recommendations from the most complete gage line. Then, compare our choices with any others. We're willing to rest our case on your good judgment. Write or call us today.

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Ask **FEDERAL** First

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic—for Inspecting, Measuring, Sorting, or Automation Gaging

AIR-ELECTRIC GAGES

AIR GAGES

All Attachments
Automation
Continuous
Multiple
Special

AUTOMATION GAGES

Employing all gaging systems
Continuous
Inprocess
Machine Control
Sorting

DIAL GAGES

Caliper
Comparators
Depth
Groove
Hole
Snap
Thickness
Thread
Special
Etc., etc.

DIAL INDICATORS

The only complete line
Long Range
Perpendicular
Super-sensitive
Test Indicators
Test Sets
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ELECTRIC-DIAL INDICATOR GAGES

ELECTRONIC GAGES

Automation
Continuous
Multiple
Special
Super Master Comparator

GRINDING GAGES (Continuous)

Air
Air Electric
Electric

INDICATING MICROMETERS

MASTER SETTING DISCS
AND RINGS

MULTIPLE DIMENSION GAGES

THOUSANDS OF SPECIAL
DESIGNS FOR THOUSANDS
OF SPECIAL NEEDS

FREE TECHNICAL LITERATURE

Fire extinguishers

A complete line of fire extinguishers as well as fire detection and protection systems is described and illustrated in new 12-page catalog. Space is given to new series of wet chemical, portable fire extinguishers including pressurized and brass container units, including a 2½-gal pressure-operated combination water and anti-freeze extinguisher. Other additions to the line include 2½-gal and 5-gal pump tank type extinguishers which may be charged with clear water or anti-freeze solution and 1-qt, 1½-qt and 1-gal carbon tetrachloride extinguishers and chlorobromomethane extinguishers which are pressurized with either air or nitrogen to 150 psi. *Walter Kidde & Co., Inc.*

For free copy circle No. 11 on postcard, p. 133

Ductile iron castings

A folder explains in text and photographs the properties of ductile iron which make it valuable for use. Attention is given to the company's equipment for fabricating ductile iron, with discussion of foundry, plate shop and machine shop facilities. *Bethlehem Foundry & Machine Co.*

For free copy circle No. 12 on postcard, p. 133

Nickel cast irons

A paper describes nickel austenitic ductile irons—new engineering materials that combine the strength and ductility of ductile cast iron with the resistance to corrosion, heat and metal-to-metal wear possessed by conventional Ni-Resist castings. Comparison is made of the properties of conventional and ductile Ni-Resist irons and a summary is given of present and potential industrial applications. *International Nickel Co.*

For free copy circle No. 13 on postcard, p. 133

Forgings

"Management Guide to the Use of Forgings" is a 6-page booklet prepared for those responsible for recommending or specifying, stating the advantages forgings offer to the designer, the metallurgist, the purchasing agent and executive management. *Drop Forging Assn.*

For free copy circle No. 14 on postcard, p. 133

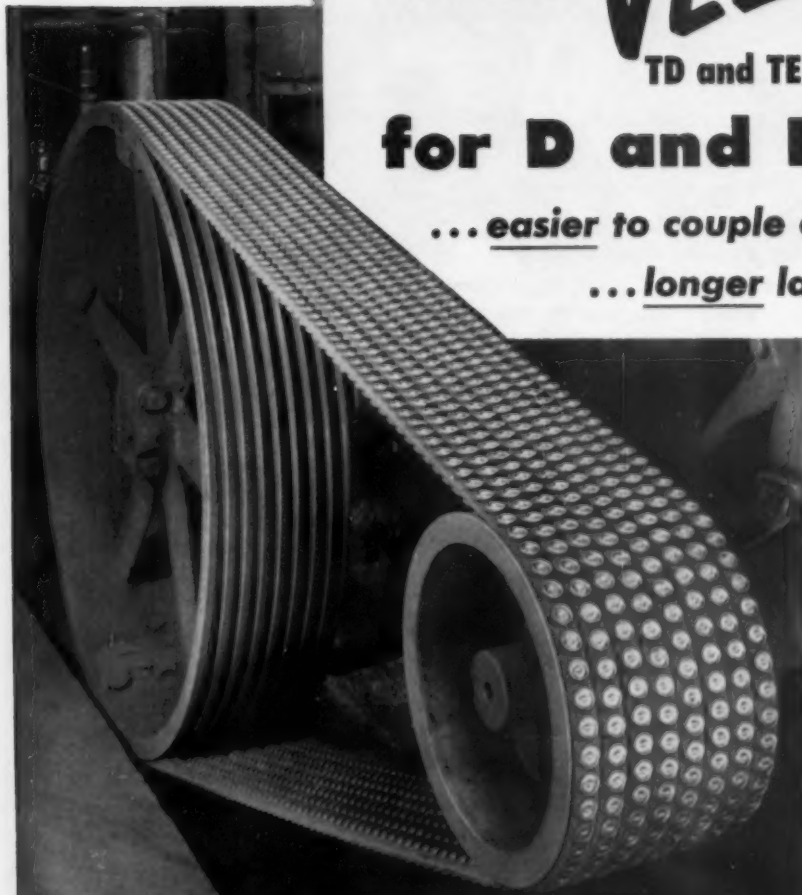
NEW VEELOS

TD and TE Adjustable V-belts

for D and E Drives

... easier to couple and uncouple

... longer lasting

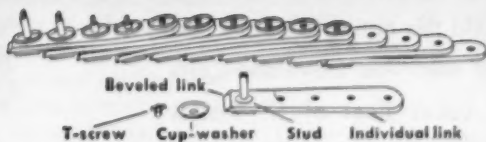


Now get the v-belt that's been especially developed for D and E drives—the new, patented Veelos TD and TE adjustable v-belt!

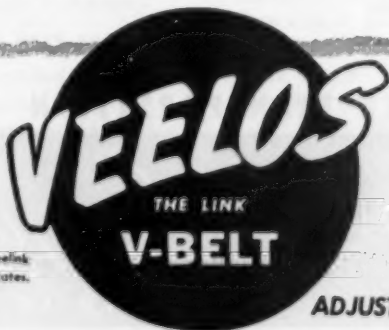
This new Veelos has advantages unmatched by any other v-belt. It is installed quickly without removing the outboard bearings found on most D and E drives. It is the easiest v-belt to couple and uncouple ever developed. Cup-washers and T-screws join links together to form individual belts of any length. Veelos TD and TE lasts longer because new high-tensile strength links plus the new stud, cup-washer and T-screw design give added strength—combines this added strength with maximum flexibility for cooler, smoother running.

Install this new Veelos TD and TE v-belt on your D and E drives. Prove to yourself why there's no v-belt that can match the performance, the efficiency and the economy of Veelos TD and TE.

Get the complete story of this great new v-belt for D and E drives. Send the coupon now for new 8-page illustrated catalog.



This detailed line drawing of the new Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job...easier!



Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
653 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

Name.....

Company.....

Address.....



ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE



Everyone

in your organization
should know...

that our reputation in producing quality iron ore (Jaspers Ores included) is borne out by more than one hundred years of experience.

Our company in conjunction with other American industries has helped build this nation in peace and furnished the sinews for war. The Cleveland-Cliffs Iron Company's Great Lakes fleet of 17 vessels carries our ore to every port in the prime industrial area of the United States. Consult us about your Ferro Alloys and Coal Needs.

IRON ORE ★ ALLOYS ★ VESSEL TRANSPORTATION ★ COAL

The Cleveland-Cliffs Iron Company

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 128

Milling machine

A milling machine using a new type of tracer control for three-dimensional reproduction is described and pictured in a 4-page folder. In addition to the automatic tracer control, which the maker states will follow the finest detail in a model without touching it, the folder discusses the miller's directional drives, cutter spindle, construction, control, and lubrication. *Pratt & Whitney Div., Niles-Bement-Pond Co.*

For free copy circle No. 15 on postcard

Protective coating

A folder gives general properties, physical properties, chemical properties and an ordering guide for Dimetecote, an inorganic coating designed for maximum resistance to all weather conditions. *Amercoat Corp.*

For free copy circle No. 16 on postcard

Beryllium copper strip

"Specifying Beryllium Copper Strip" is the title of a 12-page bulletin which discusses the advantages of the alloy, its applications, reasons for developing precision strip, suggestions for ordering, tolerances, and properties. Weight tables are also given. *Penn Precision Products, Inc.*

For free copy circle No. 17 on postcard

Nuclear test reactor

A new bulletin describes the operation of a light-water and oil-moderated nuclear test reactor using heterogeneous enriched fuel. Bulletin depicts through description, drawings and photographs the design features and construction of the reactor. It also lists many of the reactor uses. *General Electric Co.*

For free copy circle No. 18 on postcard

Dial type millers

This publication discusses and illustrates a line of dial type milling machines available in plain, universal and vertical styles with or without automatic table feed cycles. Covered in the booklet are design features, photo-caption index to operating controls, dimensional drawings, lists of standard equipment supplied with the various styles and their specifications. *Cincinnati Milling Machine Co.*

For free copy circle No. 19 on postcard

Abrasive disks

A complete line of abrasive disks and cylinder wheels is described and illustrated in new 20-page catalog. In addition to a chart showing the variable factors influencing the selection of abrasive disks and cylinder wheels, the catalog includes a description of the types and sizes of abrasives manufactured to meet various flat surface grinding requirements. *Gardner Machine Co.*

For free copy circle No. 20 on postcard

Conversion chart

A pressure conversion chart gives equivalents for inches of mercury, millimeters for mercury, pounds per square inch, pounds per square foot and atmospheres for values of 0 to 5 psi, 0 to 50 psi, and 0 to 150 psi. Another chart shows conversion into each other of pounds per square inch, kilograms per square centimeter, inches of water, feet of water, inches of mercury, millimeters of mercury, and atmospheres. *Consolidated Engineering Corp.*

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FIRST CLASS
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THE IRON AGE

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Village Station
NEW YORK 14, N. Y.

FREE TECHNICAL LITERATURE

Materials handling pipe

Construction and application of Ashcolite pipe and couplings for pneumatic and hydraulic materials handling systems is described in a new data sheet. The sand-spun pipe has uniform wall thickness, high resistance to wear, freedom from blow-holes, sponginess and warp-age. One section of the data sheet describes coupling construction and selection of the proper couplings for particular applications. Line drawings, diagrams, schematics and dimension tables illustrate assembly, methods of determining pipe and coupling sizes and applications of blind flanges and gaskets. *The Allen-Sherman-Hoff Co.*

For free copy circle No. 22 on postcard

Industrial equipment

Manufacturer of industrial furnaces and heavy materials handling equipment has 32-page brochure of descriptive and technical information on how company's products are used. Sections deal with heating and heat treating furnaces, and such mechanical equipment as forging manipulators, clay guns, butterfly valves, etc. Materials handling equipment including trailers, dump and custom engineered transfer cars and water purification systems are discussed. *Salem-Brosius, Inc.*

For free copy circle No. 23 on postcard

High temperature grease

Technical bulletin describes Sun 844X grease—a high-melting-point, short-fibred grease compounded to resist oxidation at temperatures up to 250°F. Application methods, characteristics of the grease and its advantages to the user are discussed. A time-temperature chart shows life of the grease at various operating temperatures. *Sun Oil Co.*

For free copy circle No. 24 on postcard

Chain conveyors

"Helpful Hints on Conveying With Rex Roller Chains and Attachments" is the title of a folder showing stock attachments, made to order attachments, and special attachments which can be furnished with roller chain. *Chain Belt Co.*

For free copy circle No. 25 on postcard

Salt bath carburizing

"A Review of Salt Bath Carburizing" includes two articles on the subject which discuss liquid phase carburizing, effects of temperature, use of various catalysts, and the advantages of the process. *American Cyanamid Co.*

For free copy circle No. 26 on postcard

Solvent recovery

A 36-page booklet is available on the Columbia activated carbon system for recovery of solvents vaporized in the manufacturing process. Discussed are principles of the system's operation, where it can be used, equipment required, costs of operation and technical data. *Carbide & Carbon Chemicals Co.*

For free copy circle No. 27 on postcard

Control relays

Sectional-pole heavy-duty 10-ampere control relays which occupy minimum panel space are described in a new bulletin. The relays, available in models with from two to twelve poles, can be mounted side-by-side with practically no clearance between them, with wiring run across their enclosed tops to reduce wiring gutter requirements. Bulletin gives dimensions, enclosures, features, data on maintenance and pole conversion from normally-open to normally-closed, as well as listing available layout template kits and other literature. *Clark Controller Co.*

For free copy circle No. 28 on postcard

Temperature controls

A complete line of differential expansion temperature controls is described in a newly-issued catalog. Included are pictures of all the company's current types of controls, a description of their operation, the general specifications of the line and an instrument selection chart. Instruments discussed are electric and pneumatic types for ranges from sub-zero to 1800°F. They are suitable either for controlling temperatures or for high temperature safety alarms and cut-outs. *Burling Instrument Co.*

For free copy circle No. 29 on postcard

BUSINESS REPLY CARD
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POSTAGE WILL BE PAID BY

THE IRON AGE

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Village Station

NEW YORK 14, N. Y.

FIRST CLASS
PERMIT NO. 34
(Sec. 369 P.L.R.)
New York, N. Y.

Postcard valid 6 weeks only. After that use 11/17/55 own letterhead fully describing item wanted.

Circle numbers for Free Technical Literature or Information on New Equipment:

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Why TIMKEN® thrust bearings last longer

WHEN steel meets mandrel in the piercing mill at Youngstown Sheet and Tube Company's Campbell Works, the steel has to give. A Timken® thrust bearing takes the terrific pressure that's exerted on the mandrel. And Timken bearings in these thrust blocks can take it as proven by 20 years of continued use.

Full line contact between rollers and races is one reason Timken bearings stand up so well on this punishing job. It gives Timken bearings

extra load-carrying capacity.

Another reason Timken bearings last and last is because rollers and races are case-hardened. This gives Timken bearings a hard, wear-resistant surface over a tough, shock-resistant core. And wear is reduced because the true rolling motion and incredibly smooth surface finish of Timken bearings practically eliminate friction.

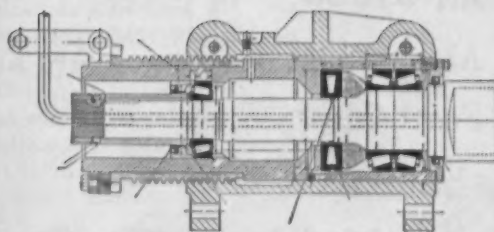
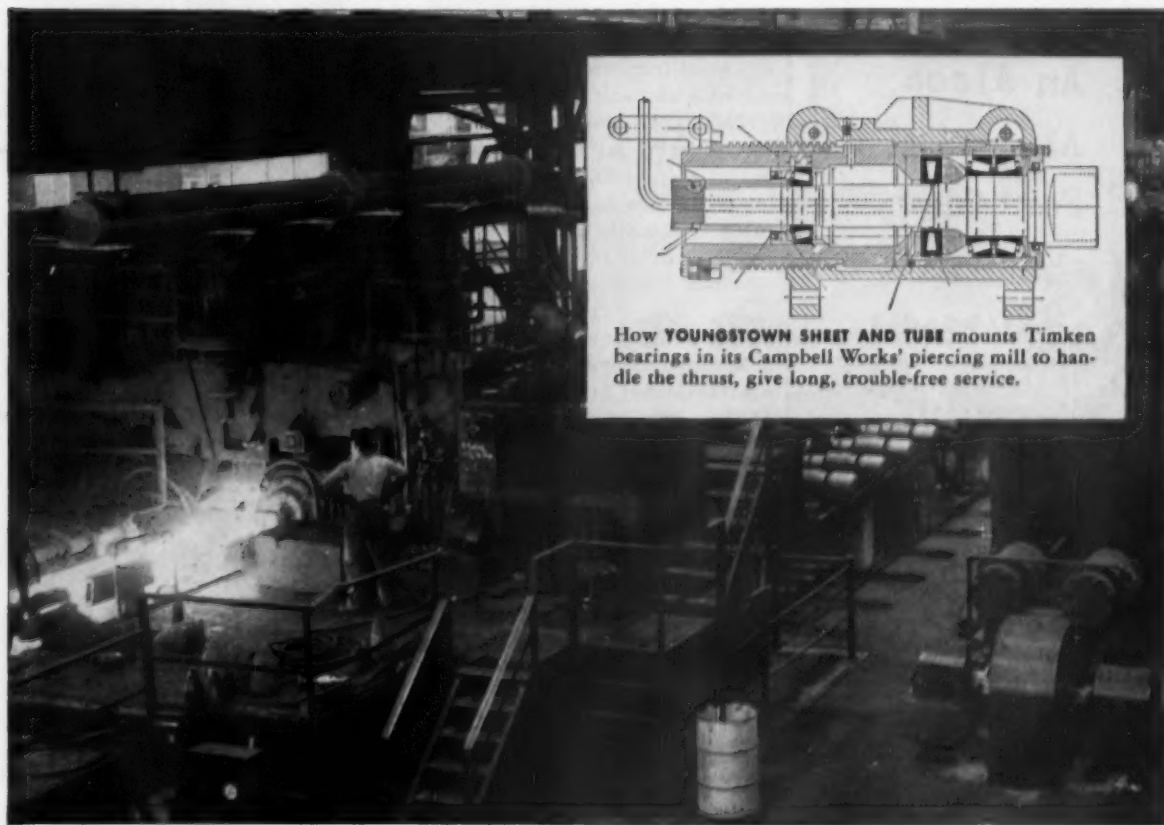
Other Timken bearings in this application (see diagram) help handle some of the thrust. That's because

the tapered design of Timken bearings enables them to take *any* combination of radial and thrust loads.

To get these advantages in the equipment you build or buy, always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Canadian plant: St. Thomas, Ontario.



This symbol on a product means its bearings are the best.



How YOUNGSTOWN SHEET AND TUBE mounts Timken bearings in its Campbell Works' piercing mill to handle the thrust, give long, trouble-free service.

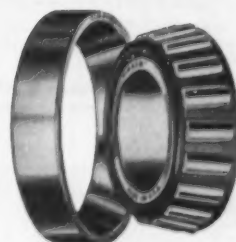
IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

$$\text{Value} = \frac{\text{quality} + \text{service} + \text{public acceptance}}{\text{price}}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

CORROSION: Salt Water Jackets

Aluminum casings for dock pilings may extend their life by 20 years . . . Sections have crimped ends, require no fastenings

An Alcoa
Aluminum
Fastener
should be
used here!

It's an aluminum awning assembly, worth the lasting strength of Alcoa® Aluminum Fasteners. You avoid galvanic and atmospheric corrosion. You get perfect color match; you get the very highest quality product. Your local Alcoa distributor has a complete stock.

P. S. In this awning assembly, we suggest an aluminum sheet metal screw from Alcoa's complete line of aluminum fasteners.

Aluminum Company of America
2243-L Alcoa Building, Pittsburgh 19, Pa.

Gentlemen:

Please send complete specification data and samples of your aluminum fasteners.

name _____
title _____
company _____
address _____

Always Fasten Aluminum
with Alcoa
Aluminum Fasteners

Todd Shipbuilding Docks, Galveston, Tex., is jacketing 1500 pilings with 250,000 lb of corrosion-resistant aluminum sheet. Aluminum Company of America, the supplier, estimates the aluminum jackets will add 20 years to the life of the pilings, by protecting the wood from erosion, marine organisms and salt water.

This application is the result of experimental installations by Alcoa at Pensacola, Fla. and in the lower Hudson River. The jacketing at Pensacola was in excellent condition after 15 years' exposure.

Five-ft Sections

The casings are 0.051 in. thick 5050 aluminum coiled sheet. They are fabricated in half cylindrical sections about 5 ft long which are placed around the pilings and locked into complete protective covering. Patents covering this general type of installation are held by the W. Horace Williams Co., New Orleans. The jacket design and the method of securing them, was developed by Childers Manufacturing Company, Houston, in conjunction with installation engineers at Tellepsen Construction Company.

No Fastenings

Each section has stovepipe-type crimping at the end so the lengths can be joined without screws or other fastenings. Locking strips overlap the joints to provide continuous strength. Spacer clips assure proper spacing between the aluminum casing and the wooden piling.

Casing sections are installed from a raft at water level. As sections are added, the entire assembly is lowered until the bottom end is imbedded in the ocean floor.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 133. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

A mixture of asphalt and sand is poured into the space between the aluminum jacket and the pier piling, thus forcing the water up and out at the top. This mixture provides an excellent barrier and seal between the casing and the pile.



Protects piling . . .

Instruments:

Thermocouple pyrometer speeds foundry production

A thermocouple pyrometer for foundry use has simplified temperature determinations and upped production in the induction shop of Crucible Steel Casting Co., Lansdowne, Pa.

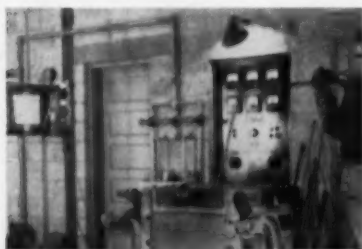
Crucible's induction shop produces carbon and alloy shell castings and stainless steel castings, and works with a variety of complex alloys and straight carbon

TECHNICAL BRIEFS

steels. Shell-molded castings produced, often of intricate shape, range in size from $\frac{1}{8}$ to 10 lb, and stainless castings go to 150 lb size. Shell tolerances are sometimes held to 0.002 in.

Checks Melt Progress

Principal application for the couple is in checking bath temperatures in the shop's two Ajax-Northrup induction furnaces, to assure proper temperature at pouring and to obtain maximum production from the furnaces by pouring as soon as correct temperature is reached.



Checks melt progress . . .

A second pyrometer unit is being used in the main foundry for checking progress of the melts in electric arc furnaces, by the spoon test method, and for checking temperature of the metal as it's poured from the bull ladle on the pouring floor.

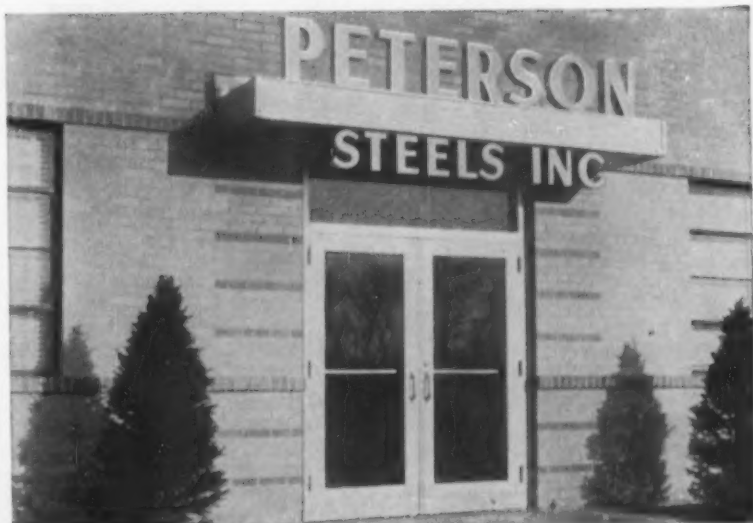
Atomic Energy:

Nuclear Congress dinner to hear Strauss

Admiral Lewis L. Strauss, Chairman of the U. S. Atomic Energy Commission, heads the list of speakers at the All-Congress Dinner of the Nuclear Engineering and Science Congress, to be held in Cleveland Dec. 16, at the Statler Hotel.

Admiral Strauss will provide the keynote address for more than 2000 delegates to the Congress. Business, industrial and political leaders, as well as engineers and scientists in the nuclear fields, will attend the dinner, winding up the week-long meeting.

Some 300 technical papers on various aspects of progress made



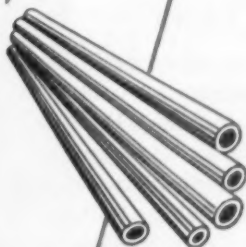
DOORWAY to
YOUR STOCKPILE OF

52100

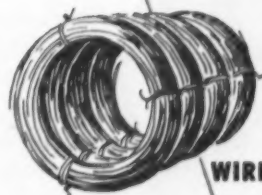
STEEL TUBING and BARS



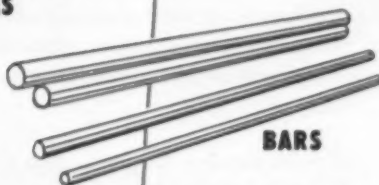
FORGINGS



TUBES



WIRE



BARS

Write for the latest stock list.

Contains complete information on sizes, finishes, analyses, etc.

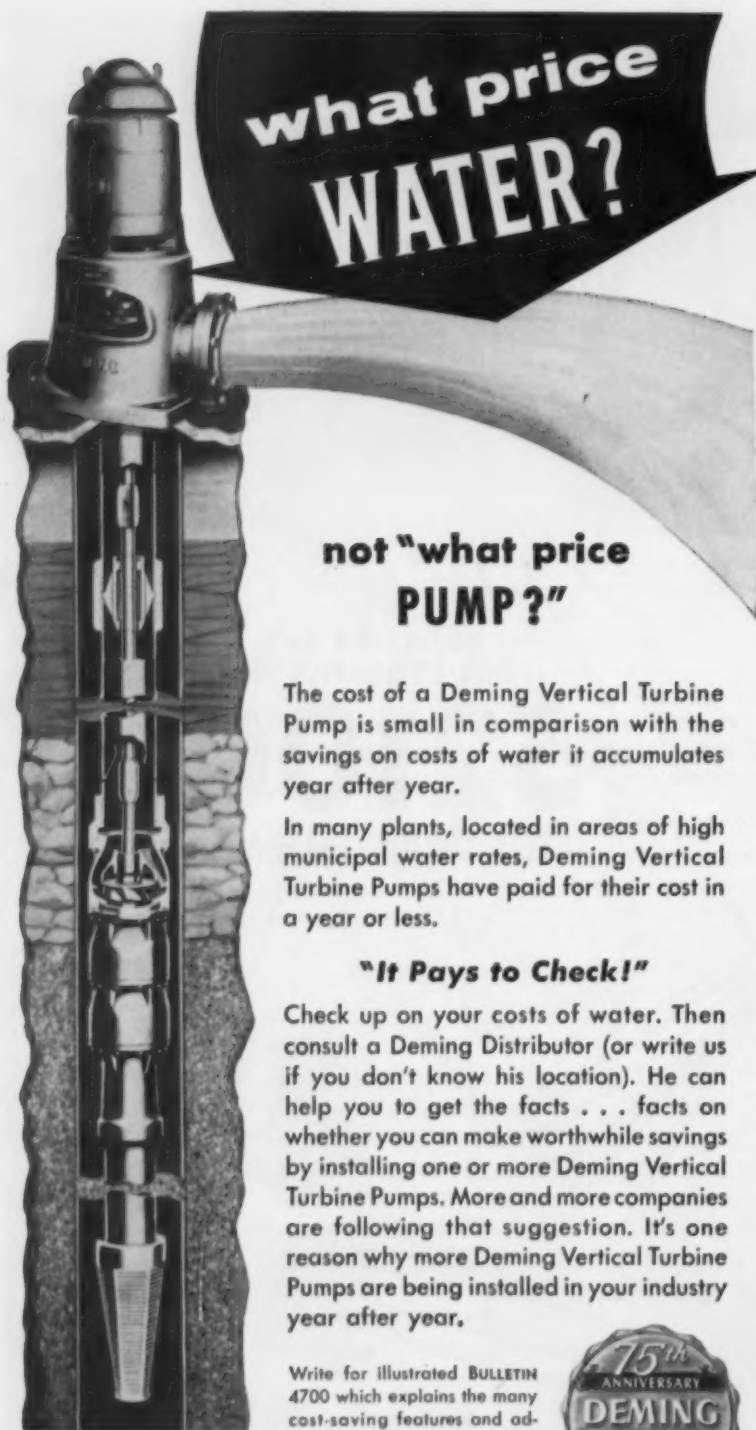
*Leaded and Non-Leaded
55-1



PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois



what price
WATER?

not "what price
PUMP?"

The cost of a Deming Vertical Turbine Pump is small in comparison with the savings on costs of water it accumulates year after year.

In many plants, located in areas of high municipal water rates, Deming Vertical Turbine Pumps have paid for their cost in a year or less.

"It Pays to Check!"

Check up on your costs of water. Then consult a Deming Distributor (or write us if you don't know his location). He can help you to get the facts . . . facts on whether you can make worthwhile savings by installing one or more Deming Vertical Turbine Pumps. More and more companies are following that suggestion. It's one reason why more Deming Vertical Turbine Pumps are being installed in your industry year after year.

Write for illustrated BULLETIN 4700 which explains the many cost-saving features and advantages of Deming Vertical Turbine Pumps.



DEMING PUMPS

THE DEMING COMPANY • 566 Broadway • Salem, Ohio

TECHNICAL BRIEFS

toward peaceful applications of the atom are programmed for the Congress. Thorndike Saville, President of Engineers Joint Council and dean of New York University's college of engineering will make the welcoming address at the dinner. Walker L. Cisler, President of Detroit Edison Co. and chairman of the Atomic Industrial Forum, Inc., will be toastmaster.

Coordinated by Engineers Joint Council, the Congress begins Monday, Dec. 12, and continues through Friday. The Atomic Exposition, displaying latest devices and materials for industry, will begin Dec. 10 in the Exhibition Hall of Cleveland's public auditorium, then run concurrently with the Congress.

Tooling:

**Cemented carbide tool
lasts 1/3 longer**

A 33 1/3 pct boost in tool life on facing cast stainless steel flanges was recently reported by a St. Louis firm using Kennametal's newest general purpose steel cutting material, Grade K21.

The company, Midwest Alloys, Inc., cites one typical operation in which a K21 insert was used for 160 hours.

3 to 14 In. Diams

A 24-inch Bullard vertical boring mill was employed in working the Type 316 stainless steel flanges



Longer cutting life . . .

—an operation that required facing over bolt holes in flanges ranging from 3 to 14 in. in diam. The bolt holes represented a severe in-

DOWN a humid 180 feet
below water level at
Downsville Dam

UP in the corrosive air
at a water cooling tower



Some 3600 feet of 2" Everdur Conduit (E.M.T.) protect electric lines in a service shaft plunging down to the release water chamber 180 feet below water level at Downsville Dam of the New York Metropolitan Water Supply System. Electric lines operate vital valves, indicating and communication equipment.

EVERDUR Conduit will guard the electric power lines—for years

Everdur® Never Rusts. It offers high resistance to other types of corrosion. That's why Everdur Conduit—made from one of Anaconda's exclusive copper-silicon alloys—is specified for dependable year-after-year protection of electric power lines in industry, on bridges, at power and water supply projects—wherever water and corrosive atmospheres are a problem—or where conduit must be buried or embedded in concrete.

Everdur is Tough. In addition to corrosion resistance, Everdur has high physical strength, resists wear and abrasion. It stands up under movement and vibration, as on a bridge, in a subway, in a factory.

Everdur is Nonmagnetic. Everdur Conduit creates no magnetic field to produce temperature rise in electric power cables.

Everdur Electrical Conduit is available in two wall thicknesses—R.C. in nominal sizes from 1/4" to 4", inclusive, and E.M.T. in nominal sizes 3/8" to 2", inclusive. For more detailed information write: The American Brass Company, Buffalo Division, Buffalo 5, N. Y. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

*Reg. U. S. Pat. Off.

EVERDUR ELECTRICAL CONDUIT

ANACONDA
COPPER SILICON ALLOYS

During the War, General Petroleum Corp. saw galvanized conduit fail within a year at one of its plants—replaced it with Everdur Conduit. At its new Ferndale Mobilgas Refinery in Washington, some 12,000 pounds of Everdur Conduit in various sizes guard electric power lines for motors and lighting in this water cooling tower.

CORROSION RESISTANT • STRONG • NONMAGNETIC • WORKABLE • WELDABLE

for a
better product

start with

BETTER

STAINLESS STEEL STRIP



SPECIFY

WALLINGFORD

Modern machines, advanced atomic and electronic quality control devices and quality-conscious personnel make WALLINGFORD STAINLESS STEEL STRIP *better* . . . and make the manufactured product *better*.

Better strip means better output, too. WALLINGFORD STAINLESS STEEL STRIP gages uniformly, draws easily, punches cleanly . . . to reduce spoilage and tool costs.

• THINNESSES TO .002" • ACCURACY TO $\pm .0001$ " • SPECIAL SECTIONS ROLLED TO YOUR EXACT DESIGN

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STAINLESS • ALLOY • HIGH CARBON • LOW CARBON
STRIP • STAINLESS WELDED TUBES AND PIPE

TECHNICAL BRIEFS

interrupted cutting problem.

The improved clamped insert was used with a Style BLH-20 tool. Feed was 0.020 in. per revolution at 145 sfpm. Depth of cut was 3/32 in.

Most Consistent Grade

Of the several carbide grades tested during similar operations, Grade K21 provided the most consistent performance, according to Midwest Alloy. Operating conditions vary only slightly with different size flanges.

The new steel-cutting grade cemented carbide has an RA rating of 91.0 and is reported to be ideal for either general cutting, heavy roughing or finishing. Chief characteristics claimed for Grade K21 are high edge-strength, superior wear quality and excellent resistance to cratering.

Forging:

Industrial TV Indicates press unbalance

Industrial television helping to protect a massive 35,000 ton forging press at Aluminum Co. of America's Cleveland works, is expected to help improve forging die design as well.

The press, in the U. S. Air Force heavy press plant, forges sections for military aircraft, and is so powerful that an off-center load

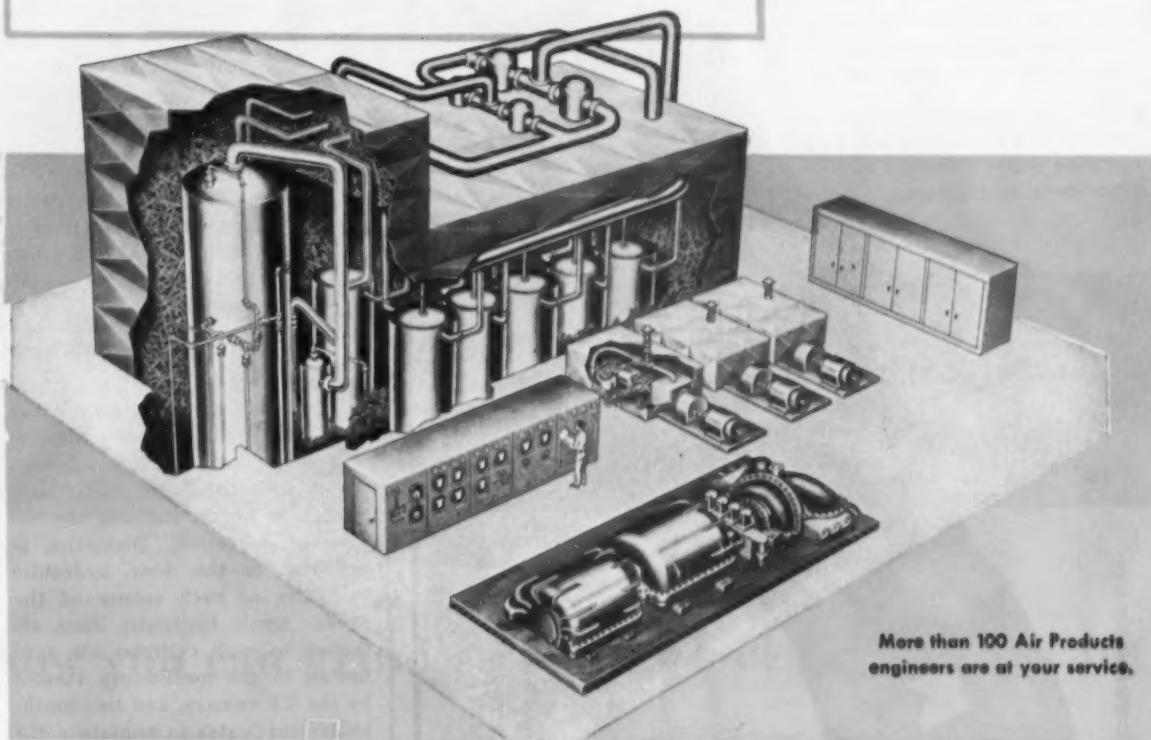


Warns operator . . .

might unbalance its precise accuracy or even ruin the entire machine. The TV camera is therefore located in the press foundation, to keep watch on a hydraulic mechanism which indicates eccentric loading.

Let Air Products Engineers

*discuss your expansion plans—
OXYGEN can mean more steel*



More than 100 Air Products engineers are at your service.

What plant additions are you planning, to produce your share of the 24,000,000 ton steel ingot increase by 1960?

Even though your planning may be in the preliminary stage, a conference now with our engineers may help you to better evaluate your expansion program. Let us give you actual costs and engineering information from data based on tonnage—180 tons per day to 500 tons per day—oxygen generators we have actually placed in operation.

You can have oxygen and nitrogen generators to fulfill your requirements, on a lease basis, without capital investment—whether your requirements are for:

Large Capacity Tonnage Generators, regardless of size, purity, high or low pressure cycle, with liquid oxygen pumps, if your oxygen should be under pressure

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"Packaged" High Purity Generators, producing high purity oxygen and nitrogen simultaneously—oxygen delivered safely under pressure by Air Products patented liquid oxygen pumps.

Let our engineers review your requirements and give you actual figures for oxygen generating equipment in your expansion plans—even though your plans are only preliminary now.

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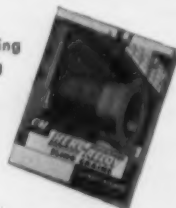
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THE ORIGINAL ALLOY STEEL CHAIN

- Herc-Alloy is a special all-purpose chain with long-wearing properties and high resistance to impact loading.
- Herc-Alloy is sold in running lengths and in all types and sizes of sling chains assembled to customers' specifications.



● Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.



● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.

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TECHNICAL BRIEFS

"Permits designers to chart causes of eccentric loading . . ."

A receiver is installed on the portable operator's control station at ground level, near the press. If the televised picture indicates excessive off-center loading, the operator is warned and can take prompt remedial action.

At the same time, the system permits designers to carefully chart causes of eccentric loading, and thus eliminate defects in future tools. The steel dies are attached to upper and lower platens of the 35,000 ton press and a sister 50,000 ton press in the Alcoa-operated plant.

Gauge Shows Unbalance

Complicated shapes of the aluminum alloy forgings may cause eccentric loading of the platens. The stretching of huge tie rods, which hold the press within safe operating limits, indicate the degree of deflection. Distortion is reflected in the four hydraulic cylinders at each corner of the press. Small hydraulic lines attached to each cylinder are connected to the mechanism viewed by the TV camera, and this mechanism duplicates in miniature the differences.

When the press is centrally loaded, a beam of light is focused on the center of a diamond shaped gauge viewed by the camera. If off-center loading occurs, the beam moves from the center toward a border of the diamond, disclosing the location of the load center.

Power:

Municipal gas-turbine power plant in use

The City of Larned, Kansas, has put into operation America's first municipal gas-turbine power plant. The 1250-kw unit supplied by Westinghouse Electric Corporation is completely self-contained. It requires no boiler or other external heat source, since



Now you can grind straight bevel Coniflex® gears

You can *now* use hardened and ground straight bevel gears for many angular drives requiring extreme precision and load carrying capacity.

The new Gleason No. 105 Straight Bevel Coniflex® Grinder generates gears with the highest accuracy of spacing and profile, with the tooth profile, fillet radius, and tooth bottom formed into one smooth blended shape by two grinding wheels.

And gears ground on the No. 105 Grinder after hardening *maintain*

their extreme precision even under continuous load operation.

Wet-type grinding on this machine provides fast cycles and excellent finish. Set-up calculations are simple. The completely automatic cycle of the No. 105 Grinder not only assures uniformity of production but also provides great savings in time and production costs.

We will gladly send you more information about the No. 105 Straight Bevel Coniflex Grinder upon request.



The No. 105 Grinder accommodates straight bevel Coniflex gears up to 8½" pitch diameter, 3DP with ratios up to 6:1, cone distances up to 4¼". Gears 20DP and finer may be ground directly from the solid; coarser pitches are ground after semi-finish cutting and hardening.

*Straight bevel gears with localized tooth bearing.



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Bunting

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THE BUNTING BRASS AND BRONZE COMPANY, TOLEDO 1, OHIO

BRANCHES IN PRINCIPAL CITIES

it burns fuel and converts the heat energy into electricity all in a single assembly. The turbine operates at 8750 rpm, and is connected to the 1563-kva, 1200-rpm generator by a single-reduction, double-helical gear.

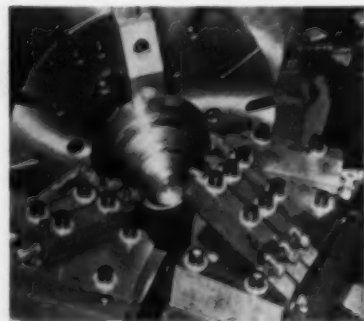
It is claimed that the gas turbine is less expensive over-all and, requires less space than a comparable engine plant or steam-electric unit. In addition it needs relatively little operating and maintenance labor. The 1250 kw gas-turbine power plant operates with no cooling water and is, therefore, highly flexible with regard to location.

Machining:

Clamped tool holders simplify machining oil well bits

Machining oil well bits was a time-consuming operation at Gisholt Machine Co., Madison Wis., until the company simplified operations by use of riser plate tooling.

Each bit requires three differently shaped cones. And the bits



Riser plate tooling . . .

come in eight sizes. Tools previously were adjusted for each operation.

Clamped tool holders were installed at the recommendation of Kennametal Inc., Latrobe, Pa. They simplified tool change over considerably. The entire riser plate with its tools is removed by loosening four bolts. Regular tool blocks are eliminated.

SAE 4815 nickel-molybdenum alloy steel is used for the drill cone blanks. Tools are fed at 0.004 ipm, with a plunge cut of $\frac{3}{8}$ in.

TECHNICAL BRIEFS

Speed used is 159 rpm and 300 sfpm. At the cone point a high-speed steel insert is employed because of the zero surface foot rate.

Inserts with 120° angle "V" bottoms are used to overcome side thrust.

Construction:

Cast iron clip speeds floor installation

A two-ounce cast iron clip used with junior beams, lightweight steel structurals made by Jones & Laughlin Steel Corp., has resulted in a new building technique that



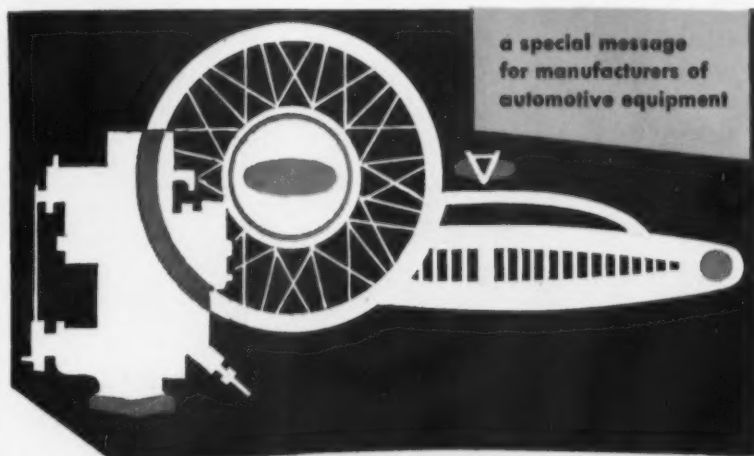
Support plyboard . . .

saves time, materials and trouble in the installation of concrete floors.

Known as the "K System," the technique has saved an estimated \$90,000 in the construction costs of a 12-story apartment building in New York City. It solves a problem that has plagued builders for many years—installing and removing forms for concrete flooring without resorting either to makeshift or time-consuming procedures.

The system involves the hooking of small cast iron clips, about three in. long, over the top flanges of the beams. Plywood rests on the clips and serves as a ready-made form for the concrete.

After the concrete is poured and hardened, workmen go along the underside of the flooring and knock off the exposed section of the cast iron clip. Part of the clip remains permanently in the floor. The plywood form drops down and can be re-used as many as 20 times.



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- **ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.
- **ON COPPER** . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.
- **ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.
- **ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

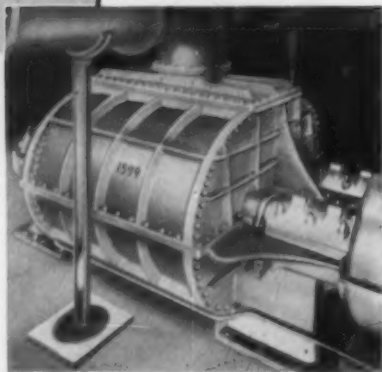
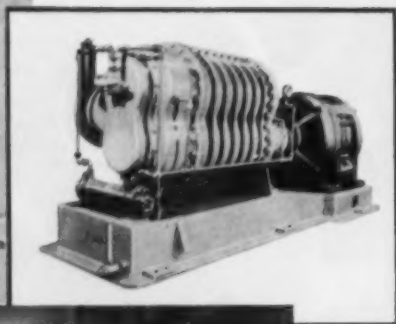
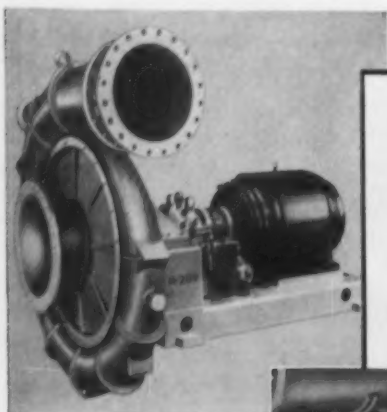
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R-C *plur-ability* PAYS DIVIDENDS WHEN MOVING AIR OR GAS

Where quantity and quality of production depend upon the reliable, economical performance of blowers, exhausters and related equipment, look to the values of R-C *plur-ability*.

- choice of centrifugal, rotary positive and Spiraxial® types, an exclusive advantage of Roots-Connersville.
- accurate control of volume and pressure.
- ample choice of capacities, from 5 cfm to 100,000 cfm.
- high efficiencies and low operating costs.
- low down-time and maintenance expense.
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All these factors add up to R-C *plur-ability*. They work for you in machines which you buy for your own use, or for resale with your equipment, where handling gas or air at moderate pressures is required. Our engineering experience and ability are at your service.

You'll find R-C *plur-ability* in all these products

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Positive Blowers, Gas
Pumps and Exhausters

• • •

Spiraxial® Compressors

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Positive Displacement
Vacuum Pumps
and Meters

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Inert Gas Generators

• • •

Whether you use or sell
equipment using gas or
air at moderate pressures,
check R-C *plur-ability*.

The \$90,000 saving in construction cost was the result of cutting an estimated \$1 per sq ft off the cost of the concrete flooring by use of the "K System." The method also gives the structure additional rigidity because the clip allows the concrete to come below the top flange of the junior beams.

Fabrication:

Cement mixer tires are hot roll forged

A critical component of 5½ and 6½ cubic yard truck concrete mixers is the steel tire on which the drum rotates. Mounted at the rear of the mixer unit, the tire has to withstand shifting weights of up to 40,000 lb without cracking loose from the drum shell, losing concentricity or developing flat spots.

Tires for mixers made by Blaw-Knox Co., Pittsburgh, are forged



Welded to drum . . .

under closely controlled conditions at the Standard Steel Works Div. of Baldwin-Lima-Hamilton Corp., Burnham, Pa. Weighing over 200 lb, the high-carbon steel rings are 51½ in. in diam and 3 in. wide and 1½ in. thick. They are hot roll forged, then rough machined.

Welded to Drum

Tires are assembled to the mixer drums in a special welding fixture. First the tire is slipped over the cone of the drum and tack welded into position. Then it is finish welded by hand, using a low-hydrogen electrode.



Roots-Connersville Blower



A DIVISION OF DRESSER INDUSTRIES, INC.

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TECHNICAL BRIEFS

The roller track is finish-machined on a 5-foot boring mill.

The drum itself is high-strength low-alloy steel, abrasion resistant to withstand the punishment meted out by sand and gravel and water churning inside. Rollers on which tire and drum rotate are made of SAE 1045 steel, machined and flame-hardened.

Conductors:

ACSR cable proved out for signal circuits

Calculated characteristics of Aluminum Cable, Steel Reinforced, have been proved out by early tests for use on railroad and communication circuits.

Reynolds Metals Co., which cooperated in the tests, says they were run on an 8-mile section of new line recently installed by the Frisco Railroad, near Chaffee, Mo. Test results showed that the ACSR cable, already widely used for overhead electric power lines in rural areas, is technically suitable and promises important advantages in economy and service continuity.

Stronger, Lighter

ACSR, a combination of aluminum strands for carrying current and a steel core to provide strength, produces a cable with 50 pct more strength and a 20 pct saving in weight. Yet it provides the same electrical conductivity as solid copper or copper clad steel conductors.

The Frisco test installation has shown the feasibility of stringing the new cable to the same span lengths and to the same sags and tensions as are employed with solid copper or copper clad steel conductors.

Conductivity Changes

The hitch in obtaining performance data on the cable was based on the fact that the conductivity factor changes. This because today's signal and communications circuits carry not only dc and 60 cycle power, but also currents at frequencies as high as 150 kc.



The Spray Booth Floor Grating That Cleans Itself . . .

engineered by PLANET

At a leading automobile plant, Planet Corporation has designed and installed a 3,400 foot multi-story dragline. It moves auto bodies through a series of lacquer spray booths, and then through drying ovens to the trim line for trim, upholstery, and glass.

Before this installation, the floor grating in the spray booths had to be removed frequently for cleaning because of lacquer accumulation.

Now, the grids are self-cleaning. They move at a rate of a few inches per minute, passing through a series of cleaning tanks under the floor.

The Planet solution to this problem has resulted in a substantial savings in cost and time.

An automatic system of this kind is just one of many ways Planet engineers can help you solve your particular materials handling problem. Their experience and know-how is available, without obligation. Write today.

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Yes, we do hundreds of stamping jobs without making special tools—and there's a good reason for this. In stamping out laminated shims for over forty years, we've developed much special equipment and tooling unknown in the aver-

age stampings house... including an arsenal of blanking dies and punches...and we've acquired unusual production techniques and skills. This equipment and these special skills are at your service without charge.

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These three separate production techniques are judiciously applied to save you money on your stamping needs!

MACHINE CUT METHOD. Regardless of quantity, we have the method that fits your needs best! For half-a-dozen or a few hundred stampings, our *Machine Cut Method* produces the stampings at amazingly low cost.

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STAMPINGS DIVISION

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"Produces line losses almost identical with those for solid copper conductors..."

With alternating current, as frequency increases, a factor known as skin effect has an increasingly important effect on a conductor's total current-carrying capacity. Skin effect is the tendency for the current, as frequency increases, to crowd more and more toward the surface of the conductor, and thus for the outer portions of the conductor surface to carry more and more of the current.

ACSR's greater surface area produces line losses almost identical with those for solid copper conductor, yet provides the high mechanical strength of copper clad steel.

Handling:

Bucket design minimizes cement plant dribbling

A specially-designed five-cubic-yd bucket being used for materials handling at the plant of Universal Atlas Cement Co., Universal, Pa., has minimized the problem of "dribbling" of fine granular materials.

The 14,250-lb. bucket, for use on an overhead traveling crane, was built by Blaw-Knox Co., Pittsburgh. The dribbling problem, and consequent dusting, is characteristic of cement plant bucket operations. For this reason, special alloy steel pins and manganese steel bushings were used



Less dusting...

TECHNICAL BRIEFS

for most moving parts on the bucket, rather than ordinary bearings. The lone exception was in the lever arm sheaves, which were mounted on sealed anti-friction bearings.

In addition, the bucket was fitted with a special main hinge design to assure rigid scoop alignment and contact edges of the lips were hard-surfaced for maximum tight fitting over a long period of usage.

Materials:

**Porous metal sealant
saves 20 pct**

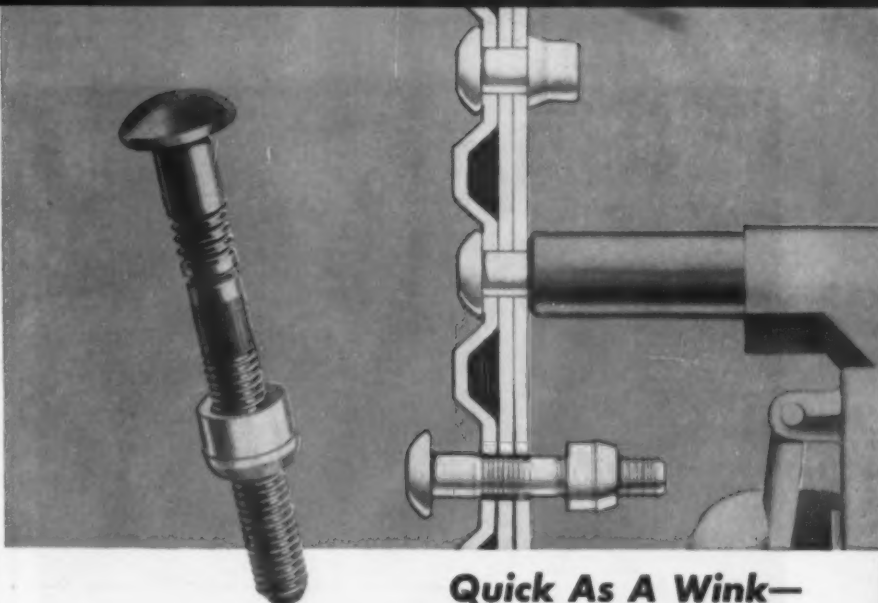
A compound being applied by Lycoming Div. of Avco. Mfg. Corp. to seal radial aircraft engine parts is claimed to save 20 pct in production costs and to have allowed a 40 pct reduction in cycle time.

Called Impco RC-2, the polyester compound was developed by Bakelite Co. and supplied to Lycoming by Impco, Inc. Magnesium alloy castings used in the aircraft engine nose sections and in oil sumps, pump bodies and supercharger housings require sealing because the shrinkage of the molten metal as it cools in casting opens up tiny voids and pores. Oil can leak through these and become a major fire hazard.

Five-hour Cycle

Previously, a production cycle of eight hours or more was required to seal the castings. Frequently castings were recycled two or three times for a complete seal, and the sealants tended to bleed out of pores, requiring extra time and labor for cleanup.

Now castings are sealed in less than five hours with just one cycle. Porous castings of a crankcase front section, as a typical example, are placed in a pressure vessel and impregnated with the sealant. Castings are then rinsed with warm water and a mild detergent to remove the excess of the self-emulsifying resin. Previous sealants required flammable solvents for excess film removal.



Quick As A Wink— You Get Secure, Permanent Fastening With Townsend Lockbolts

In less than a second, with one squeeze of the trigger, a Townsend lockbolt pulls the work together with a high clinching action, is locked in place with uniform pressure. It is a quick method of producing tight, rigid, permanent fastenings that cannot loosen even under extreme vibration or shock conditions.

Townsend lockbolts combine the advantages of riveting and bolting—eliminate the disadvantages. Installation is fast—under certain conditions, one man will install 30 in only 60 seconds. Fewer workers will complete an assembly in less time than when riveting or bolting.

The clamping action, or clinch, of Townsend lockbolts is higher than rivets—is more uniform than bolts and nuts. The lockbolt fills

the hole better than other fasteners, thus making possible a more rigid joint and also providing an effective liquid seal.

The Townsend lockbolt consists of two precision-made parts—a pin and a collar. Locking grooves are provided on the pin into which the collar is swaged by the pneumatic gun. The pulling section of the pin breaks in tension at a predetermined point when the setting action is completed.

Townsend lockbolts are available in steel and aluminum alloy, in $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ " and $\frac{3}{8}$ " diameters, in grip lengths ranging up to 2", in various head styles. For information on how to speed production, get tight, secure, permanent fastening with Townsend lockbolts, use the coupon below.

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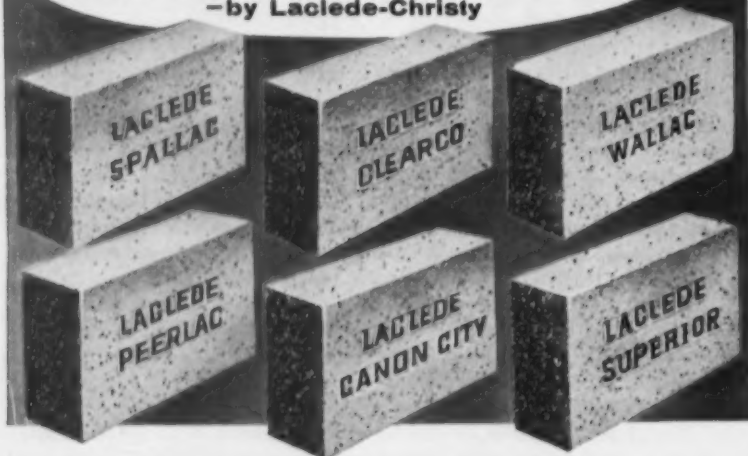
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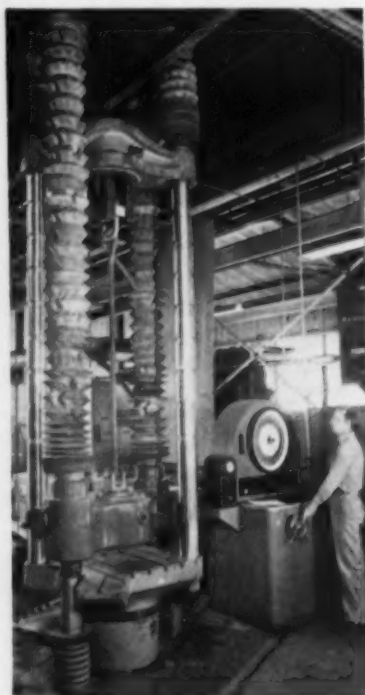
Cleaned castings are then placed in a tank of hot oil at 270°F to cure the resin. The polyester sealant gels quickly and forms a hard solid in 60 to 90 minutes.

Each casting is finally tested for leaks in water at 180 to 200°F and at pressures up to 70 psi.

Testing:

Flash-Welded Landing Hook Tested to 62,000 lbs

Aircraft arresting hooks must be proof-loaded prior to delivery by Axelson Manufacturing Company, Los Angeles, Calif. The hook is designed to bring landing airplanes to a quick stop aboard Navy aircraft carriers. Eighty-



Testing landing hook . . .

two inches long, the hook is made of steel tubing with steel forgings flash welded to each end. Tensile strength of the heat-treated AISI 4340 steel is 260,000 to 280,000 psi. Tensile load on the hook is 62,000 lb.

Loads can be applied to test specimens either at constant load or constant strain rate with load-

TECHNICAL BRIEFS

spacing and strain-spacing equipment. A 440,000 lb Baldwin universal testing machine is used. Canvas pantaloons protect the tension members from dirt.

Methods:

Ball mill noise is appreciably reduced

Safer working conditions resulting from a 97% reduction of the sound energy generated by ball mill grinding at their St. Louis plant have been reported by Mallinckrodt Chemical Works.

One operation at the plant, owned by the Atomic Energy Commission and operated by Mallinckrodt, involves ball mill grinding of a fused slag material. Prior to sound treatment, noise levels around the ball mill were approximately 108 decibels—far above the recommended maximum.

Panel-enclosure

To remedy the situation, Sound-metal Panels, a product of Industrial Sound Control, Inc., Hartford, Conn., acoustical firm, were utilized to enclose the area. These 3½-in. thick panels, containing spun lead and zinc fibers, reduced the noise level around the ball mill to 99 decibels.

Since noise level without the ball mill grinder operating is 98 decibels, company engineers calculate that the sound enclosure eliminates 97% of the sound energy formerly contributed by that equipment.

Metallurgy:

Chromium alloys sensitive to trace impurities

Traces of oxygen, sulfur, and nitrogen, impart hot shortness to chromium-rich chromium-iron and chromium-nickel alloys, reports Battelle Institute, Columbus, O. Binary alloys of chromium with vanadium, molybdenum, tungsten, columbium, or tantalum cannot be hot-rolled to sound sheets, even when made with 99.99 pct pure iodide chromium.

MAKE IT or BUY IT?



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If your company uses reasonable quantities of formed parts in steel, steel alloys, brass, inconel, magnesium, aluminum, or titanium, you have a problem: should you **make** or **buy** the stampings you need? To make the **right** decision — a decision that may **save** or **cost** your company many thousands of dollars — you must ask and answer many questions on labor force, plant space, machinery, costs, design, operations, production level, future volume.

We would like to help you reach a good decision, favorable to your company's long-run profit picture.

At this moment, **we don't know the answer** to your problem — but **let's find out!** Since no two stamping jobs are ever exactly alike, **Presteel** is proud of being able to offer a proven procedure to arrive at the right answer. Our engineers, backed by Worcester Pressed Steel's 72 years of intensive stamping experience, will sit down with you at your convenience, isolate the facts that count, and help you get all the basic information for you to make an impartial, sound decision.

For a "Make it, or Buy it" consultation with a Presteel representative, write us today. There is no charge or obligation.



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Please ask your representative to call. ☐

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Title _____ Company _____

Street _____

City _____ Zone _____ State _____

Large

or small



- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality... same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.



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BEVEL GEARS • MITRE GEARS

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GEAR & MFG. CO.

LIBERTY ST 25TH PITTSBURGH 22, PA.

Quality Gears for over 60 years

TECHNICAL BRIEFS

Workable alloy systems found include chromium-iron, chromium-nickel, and chromium-cobalt combinations. In these alloys, strengths increase and ductilities decrease in proportion to chromium content, according to bend and tensile tests. Best combinations of strength and ductility were exhibited by chromium-rich and chromium-nickel alloys.

An iron-base chromium alloy has been developed which exhibits good high-temperature strength and resistance to thermal shock. The alloy can be created from commercially available melting stock with a process adaptable to commercial use. Ingots weighing up to 12 pounds have been forged. At room temperature this alloy is malleable, but it does not exhibit measurable ductility. With these properties, alloys of this type are useful in such high-temperature applications as jet engines.

Wire:

Hand twisting costs
cut 75 pct.

Many electrical circuits in modern aircraft call for specially-twisted wire to avoid field inter-



Mechanical twisting...

ferences. To meet these specifications, Martin Aircraft Co., Baltimore, devised a mechanical wire twister operated by one worker.

The device consists of a driving head powered by a slow-speed motor, a stationary head with rotating pins for attaching the wires and a comb for leading the wires as they are being twisted.

One end of each wire to be twisted is attached to the driving

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looks like a crayon...

marks like a crayon...

tells temperatures

like a precision instrument!

Sixty-three different compositions enable you to determine and control working temperatures from 113° to 2000° F. TEMPILSTIK^o marks on workpiece "say when" by melting at stated temperatures—plus or minus 1%.

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FOR SAMPLE TEMPIL^o PELLETS
... STATE TEMPERATURES OF
INTEREST—PLEASE!

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ACITROL requires no pre-mixing—it is readily soluble at all times—and is available in foaming or non-foaming types.

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head. The other end is fed through the comb and attached to the pins on the stationary head.

The operator starts the mechanism with a remote-controlled switch carried in one hand and leads the wires with the comb held in the other hand while walking ahead of the twists. At the end of the run the mechanism is turned off through the remote-controlled switch and the twisted

group removed from the machine.

The device has cut costs 75 pct over hand-twisting operations.

Design:

High temperature bars won't overheat

A motor-driven cooling fan capable of operating for long periods

of time at temperatures to 260°F is being produced in quantity for Motorola, Inc., of Chicago.

The Garret Corp.'s AiResearch Mfg. Div. is making the units. Three of the new fans, along with a heat exchanger, cool Motorola's newly designed pressurized radar indicators for radar sets, currently being installed as aids to navigation and bombing in the USAF's medium and heavy jet bombers.

1000 Hours Without Failure

The fan had to be capable of operating perfectly for long periods at temperatures up to 260°F. In initial tests, the fans completed 1000 hour endurance runs without a failure.

An integral case around the motor permits heat to be taken out by the fan's air action. The units did not overheat at any time, nor did their grease-packed bearings burn out, unusual at such high temperatures.

The fan turns at a top 10,000 rpm and weighs just a fraction over a pound. Fan wheel diam in the unit is 2 3/4 in. Diameter of the unit itself, including the case, is approximately 2 7/8 in.

Jet Engines:

Components tested from -67°F to +200°F

Two new testers for jet engine components and controls are in use at Hamilton Standard Division of United Aircraft Corp., Windsor Locks, Conn.

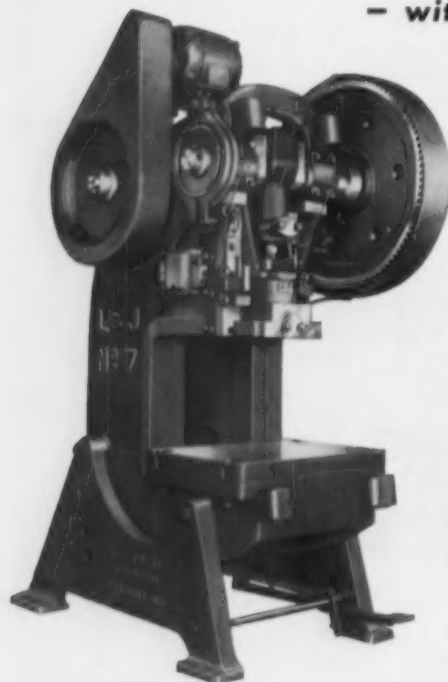
The liquid chilling unit is capable of lowering or raising jet fuel temperature to simulate actual operating temperatures. This conditioned fuel is supplied to jet fuel controls and components operating in a chamber at specific temperature, altitude and relative humidities. The fuel chiller will: 1. Pull the entire system down to obtain a fuel inlet temperature of -67°F from a +100°F temperature in an overall maximum period of three hours with a fuel flow of 30,000 lb per hour of iso-octane gasoline. 2. Dissipate a pump load

NEW L&J NO. 7 PRESS

RIGID - ACCURATE - EFFICIENT

- with a LARGER

WORK AREA



This new press will give you greater production at lower cost. Its alloy iron frame has exceptional rigidity which holds deflection to a minimum and gives closer tolerances, greater uniformity and longer die life. Accuracy is also obtained through adjustable gibs of extra length. The rugged ram adjusting screw has buttress threads and replaceable hard bronze seat. Air clutch optional. Geared and non-geared models.

Write for Catalog

Fully describes all L&J O.B.I. Presses—21 geared and non-geared models. Capacities 8 to 90 tons. Also, 20 to 50 ton High Speed, Double Crank Straight Side Presses with speeds up to 450 s.p.m. Ask for Catalog,



SPECIFICATIONS

Capacity—75 tons. Standard Stroke—4". Maximum Stroke (to order)—8". Strokes per minute—42 (non-geared type 85). Throat Depth center of ram to frame—13 1/2". Die Space*—14" to 22". Bolster Plate Area—36" x 26".

* bed to ram, standard stroke down, adj. up.



L&J PRESS CORPORATION

1623 STERLING AVE., ELKHART, INDIANA

of 65 hp with the fuel chiller operating at a pressure of 1000 psig. 3. Maintain the inlet fuel temperature at +200°F with the same load conditions.

The air chiller lowers the temperature of air supplied to simulate actual operating conditions. The air chiller will: 1. Cool 120 lb of air per minute at 13.65 psig. from +100°F to -10°F. 2. Cool 47 lb of air per minute at 13.65 psig. from +100°F to -67°F.

The air chiller is designed for continuous operation. It automatically defrosts the evaporators without interruption in the processing of low temperature air.

Titanium:

Progress report on belt grinding

Successful grinding of commercially pure titanium and its common alloys with abrasive belts depends upon reducing attritious wear. Lowering the temperature at the grinding point helps, as does use of grinding fluids which form protective films over the freshly cut metal surfaces.

Titanium is so reactive at temperatures generated in grinding that abrasive grains rapidly become dulled or flattened because of partial solution in or chemical reaction with the hot metal. These grains are dulled by attritious wear and slide over the surface of the metal, creating additional heat but doing little useful cutting.

Despite these problems, titanium can be suitably ground on a dry belt, advises Behr-Manning Division of the Norton Co., Troy, N. Y.

Belt Selection

Silicon carbide-coated abrasives give excellent results in grinding and finishing titanium. Paper-backed belts are suitable for some flat sheet work and may be used either dry or with an oil or grease. Where the backing must be more rugged, cloth-backed belts are used. Synthetic resin bonds pro-

vide maximum durability.

When water - base grinding fluids are used, fully waterproof cloth-backed products are necessary. Grits 40 to 80 are recommended for roughing and spotting operations, and grits 120 and finer for high finishes.

Belt Support

The contact roll supporting the belt should be as hard and as

small in diameter as practicable. This provides almost line contact and high unit pressure between abrasive belt and work. Heat build-up, dulling, and glazing are reduced, and fracture wear is promoted by using hard rubber, plastic or metal contact wheels.

Flat shoes or platens, and soft rolls usually lead to rapid belt failure from dulling. An exception is the use of a softer rubber



it's the finish that counts!

Roto-Finish maintains exact tolerances on precision parts with no significant dimensional changes. It makes possible a wide range of finishes applicable to parts of almost any size or shape; finishes a variety of materials — at big savings in manpower and costs. Without obligation, send sample unfinished parts to us. Include finished part for guide and your specifications. Roto-Finish will finish parts in its laboratory. You get a complete process report. You are guaranteed results and a finish that counts!

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"When a grinding fluid is used, speeds between 1500 and 2500 sfpm are recommended . . ."

roll for blending and spotting, as in the removal of small defects in sheet or coil, either before or af-

ter final reduction.

Belt Speed

When a grinding fluid is used, speeds between 1500 and 2500 sfpm are recommended. For dry grinding, speeds between 1000 and 1500 sfpm give good results. Low belt speed also reduces the tendency for the sheet surface to

be scorched or marred by accumulations of incandescent chips.

Grinding fluids can reduce the reaction between metal and abrasive grain, in addition to cooling and quenching the spark. A grinding fluid should always be used when taking continuous cuts over fairly large areas.

Dry Grinding Uses

For interrupted cuts, dry grinding is satisfactory. Spotting defects in sheets or bars, or offhand grinding of small parts, are examples.

Heavily sulfurized and chlorinated cutting oils are good grinding fluids, and can be used with most coated abrasive belts. Because of the extremely hot spark obtained in titanium grinding, only oils of the highest flash point (above 325°F) should be used. Fluid should be introduced close to the grinding point for rapid spark quenching. The exhaust or dust collecting system must be designed to minimize the fire hazard.

Water-base Fluids

Water-base grinding fluids present no fire hazard and are relatively inexpensive. But they do require the use of waterproof coated abrasive belts. Conventional soluble oils in water are poor grinding fluids for titanium, but may sometimes be useful where the alternative is grinding dry at speeds in excess of 1500 sfpm. Rust inhibitors of the nitrite-amine type give good results when used with water.

Among the most effective water-base fluids found so far are five pct solutions of sodium nitrite or barium nitrate. Since all water-soluble barium compounds are poisonous if swallowed, and since contact with eyes or skin should be avoided, barium nitrate is not recommended for most commercial applications.

Grinding Costs

Under good grinding conditions, titanium grinding with coated abrasive belts costs approximately six to ten times more than grind-

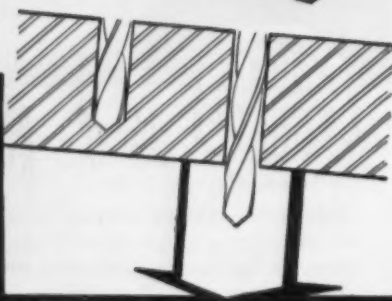
EDLUND

**Cuts Cost
\$1280.*
On One Job.***

An **EDLUND 2F**
Variable Speed
Drilling and Tapping Machine
Makes the difference

The Edlund 2F instant change variable speed feature lets you find correct drilling speed under practical on-the-job conditions. Saves valuable production time. No gear or belt changes necessary. Increases tool life by using correct drilling speed for each job requirement.

Standard or Special Models, 1 to 8 Spindles, 8", 12" or 15" overhang — capacity to 1½". Available with Power Feed, Reversing Motor Tapper, Lead Screw Tapper, and Back Gears.



The job . . . drilling 3/8" hole 1½" deep in X1020 steel. The Edlund Variable Speed machine drilled 135 pieces per hour compared with 108 pieces per hour for standard machine production. The 25% increase in production reduced costs \$1280.*

Write for Bulletin #140, a colorful, illustrated booklet describing the Edlund 2F. Specifications and quotations prepared promptly on request . . . with no obligation on your part.

* Case history folder #5F on request.

EDLUND MACHINERY COMPANY
Corland, New York Representatives in Major Cities Division — Precision Castings Co., Inc.

ing stainless steel. This estimate is based on equivalent volumes removed.

At present, costs of abrasive belt grinding of titanium and its alloys are competitive with other methods of stock removal.

New Books:

"Residual Welding Stresses," by R. Gunnert. Presents a new method of measuring residual welding stresses said to permit accuracy within ± 0.0005 mm, equivalent to a measuring error of 1 to 2 kg/mm². Nature, intensity and effect of residual stresses in welds is discussed and analyzed. Almquist & Wiksell, 26 Gamla Brogatan, Stockholm C, Sweden. 20 Kr. 135 p.

"Motion and Time Study," by Gerald Nadler. A practical work-book describing standard and new approaches with particular emphasis on modifications needed in unusual situations. The "human engineering" aspect is skillfully and competently treated. A comprehensive bibliography and list of available films is included. The compilation of films on actual case histories is particularly valuable. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36. \$7.50. 612 p.

"How to Win the Conference," by W. D. Ellis and Frank Siedel. The foreword opens with, "This is not a polite book . . . [we feel a conference] is for the purpose of cramming one idea through someone else's objections . . ." Their thesis is that even quality ideas are worthless, unless presented in an acceptable manner. A practical, tried and tested plan is detailed for doing just that. This book pulls no punches. Prentice-Hall, Inc., Englewood Cliffs, N. J. \$3.95. 214 p.

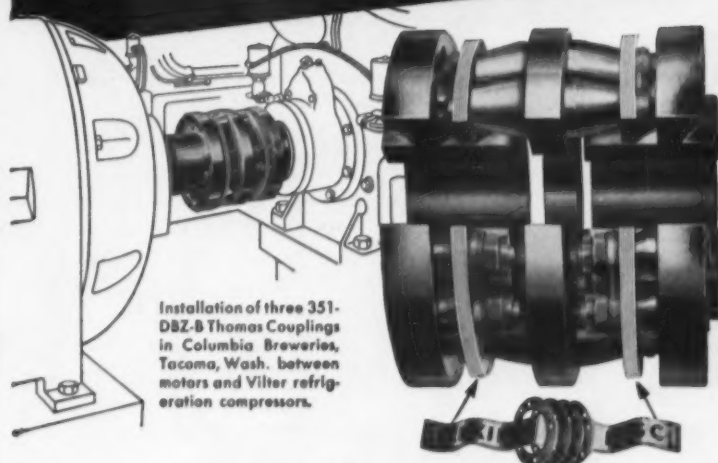
"Prospecting for Atomic Minerals," by A. W. Knoerr, G. P. Lutjen. Written by the editors of *Engineering and Mining Journal*, this "how-to-do-it" hand book offers advice on finding Uranium, right down to staking your claim and a list of required prospecting supplies. McGraw-Hill Book Co., Inc.,

330 West 42nd St., New York 36. \$3.95. 211 p.

"The Automatic Factory." A series of 20 papers delivered in June 1955 summarizing current thinking of British engineering management on automation. "Automatic Electronic Control of Machine Tools," "Automatic Transfer

Machines," and "Computer-Controlled Machine Tools" are among the technical presentations. Other papers discuss the role of managers, engineers and trade unions in the future of the automatic factory. The Institution of Production Engineers, 10 Chesterfield St., London, W. 1, England. 25/—, 228 p.

THOMAS FLEXIBLE COUPLINGS... for more years of better service!

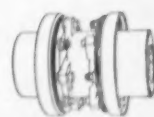


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

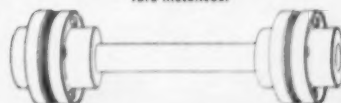
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

NEW EQUIPMENT

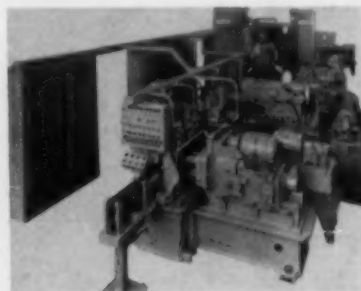
New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 133 or 134

Transfer machine increases production

Machining, gaging, washing, air testing, marking and assembling operations on automotive engine chain case covers are performed by a new segmented in-line special transfer machine. Production rate is 108 pieces per hour at 80 pct efficiency. Machine incorporates the latest concepts in segmented automation, including individual

bases, separate control panels for each segment, and a compact master control panel. There are eight segments, each having separate bases and control panels. A single transfer bar carries parts from station to station through the machine. *Snyder Tool & Engineering Co.*

For more data circle No. 30 on postcard, p. 133.



Bloom and billet turner for conditioning

The Hydra-Turn bloom and billet turner was developed to make the turning of blooms for inspection or scarfing quick, effortless and safe. By manipulation of a hydraulic control-lever blooms can be lifted into working position and turned so that any desired face is

up. The Hydra-Turn is completely self-contained with its own high-efficiency hydraulic unit, powered by a 15 hp motor. Power system is completely enclosed for protection outdoors. Square sections or rectangular sections can be handled by the machine. *Evans Enterprises.*

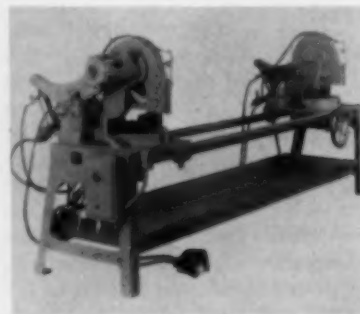
For more data circle No. 31 on postcard, p. 133.

Double cutting machine for non-ferrous metals

Double cutting machine designed for cutting all non-ferrous metals with saw blades, and ferrous metals with abrasive cut off wheels, can handle cutting lengths ranging from 22-in. min. to 102-in. max. Either of the machine's two semi-independent heads that cut simultaneously can be positioned to make 90-degree cuts, or cut at any degree up to and including 45° in either direction. Machine is pow-

ered by two 3½ hp induction type geared-in-head motors. Power stroking of the cutting heads is air-actuated by a foot pedal valve with automatic return. Oil mist sprays lubricate the blades through each cut. When cuts are completed, the saw blades retract automatically into guards and operator removes cut section. *Stone Machinery Co.*

For more data circle No. 32 on postcard, p. 133.



Gamma ray projector for radiography

A Gamma ray projector has been designed for radiography of large diameter, heavy-walled pressure vessels, and for heavy fillet and butt welding assemblies, such as rigging equipment, castings and heavy-walled pipe. Unit reduces the excessive maintenance of x-ray machines and radiographs a thickness

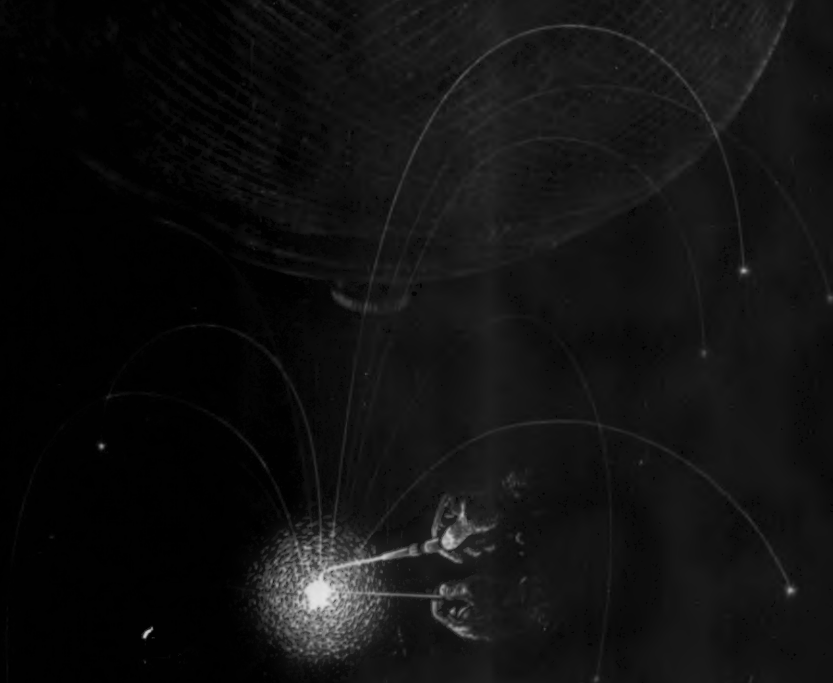
impossible with field x-ray machines. Projector, which is equipped for both spot and panoramic shots, can be cart mounted or hoist mounted. The projector weighs only 2,900 lb and is designed so there is an option for mounting it on a mobile rig in factories. *M. W. Kellogg Co.*

For more data circle No. 33 on postcard, p. 133.



C	Mn	Pmax	Smax	S	Cr	Mo
0.28/0.33	0.40/0.60	0.040	0.040	0.20/0.35	0.80/1.10	0.15/0.25

4130 steel is your best bet for light sections



4100 steels are your best bet

Chromium Molybdenum Steel like AISI-SAE 4130 is the answer for parts requiring high strength and toughness in light sections. For aircraft parts, heat-treated compressed gas cylinders and other thin sections, the move is to plentiful Moly. For information, write Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.



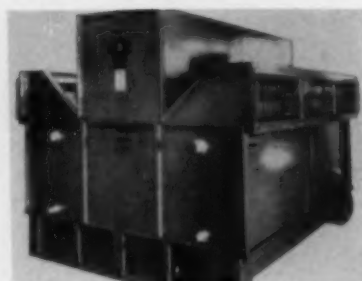
CLIMAX MOLYBDENUM

Heat exchanger for use in industrial cooling

A new panel casing Aero heat exchanger is provided for water saving in industrial cooling and for close control of temperatures within 2°F. The machine cools by evaporation and obtains the temperature control by modulating the use of outdoor air. In model shown there are four sizes affording capacities

from 7-million to 18-million Btu/hr under standard conditions. Weight range is from 9300 to 20,500 lb. Manufacturer also builds smaller and larger units in other types. Maximum space required for the unit is 199 in. by 140.5 in. *Niagara Blower Co.*

For more data circle No. 34 on postcard, p. 133.



Automatic cycle timer is sturdy, compact

Readily adaptable to any air operated equipment where consistent, accurate air cycling is required, this automatic cycle timer is a sturdy compact unit. It contains an auxiliary circuit for triggering electrically any outside unit (hopper, selector, solenoid,

etc.), which may be used in conjunction with the air equipment. Timer can be set to supply a quantity of air for a pre-determined time interval ranging from 1/4-second to 60 hours. *Model Machine Co., Inc.*

For more data circle No. 25 on postcard, p. 133.

Moves heavy equipment easier

Designed to cut the time required to move heavy equipment, the Mighty Mover consists of four dollies each with two four-in. roller-bearing rollers, with tough-

steel sides and a swivel top plate with threaded hole to which machinery is bolted. In use, equipment to be moved is raised with a simple mover's jack, the Mighty Movers

bolted on, and the move completed by pushing or by use of a pry bar. The Mighty Movers carry loads to 90 tons. *Acorn Co.*

For more data circle No. 36 on postcard, p. 133.

as basic as . . .



Designed, developed and constructed for maximum versatility, MAY-FRAN conveyor components now provide users with the ultimate of flexibility. Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. Sections can be assembled to form virtually any type of hinged-steel belt conveyor for handling stampings, formed metal parts, forgings, automotive scrap, chips and turnings and many other miscellaneous products.

Straight sections . . . concave or convex curved

Now you can buy CUSTOMIZED conveyors in pre-fabricated STANDARD sections

MAY-FRAN ENGINEERING, INC.

6070-MF

1698 Clarkstone Road

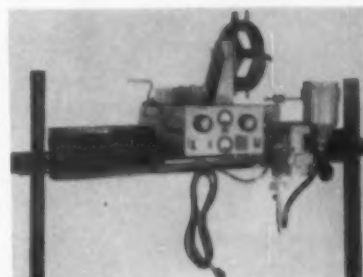
Cleveland 12, Ohio

Beam carriage used with automatic welding head

Beam carriage, driven by 10-v dc motor through a double worm gear reduction mounted in a gear case, is used with Model ASM-5D and ASM-5T automatic welding heads. A set of spur gears provides two travel speed ranges, while friction roll propels the carriage on rollers.

A crank disengages the drive roll and simultaneously raises welding head so carriage can be positioned manually. Beam carriage can be equipped to perform submerged arc, inert-gas or open arc welding. *Hobart Brothers Co.*

For more data circle No. 37 on postcard, p. 133.



Machine grinds nominally 0.125-in. slots in vane type refrigerator compressor rotors and then finish grinds these same slots to 0.138 to 0.140 after heat treating to 55-58 Rc. Material in the rotors is 8655 steel. Finish slots ground to a production surface finish of five microinches or less and total variations in flatness and parallelism between the opposing faces of the slots are held to less than 0.0003-

Rough and finish slot grinding

in. Slots ranging up to 1/4-in. wide and up to an inch or more deep can be ground. Some of the features of the machine are: automatic diameter compensation as wheel is dressed, two-speed motor for high surface speed for roughing and medium speed for finishing and air-oil feed system to regulate rate of down feed of the wheel. *Planet Products Corp.*

For more data circle No. 38 on postcard, p. 133.

sections . . . take-up and powered end sections can be furnished to meet specific needs as pertain to conveyor belt width, physical limitations as well as required volume and load capacities.

Once installed, a MAY-FRAN conveyor can be dis-assembled and re-assembled in another plant location . . . quickly, easily and with minimum down-time. In addition, conveyors can be lengthened, shortened or modified in almost any way at minimum cost.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with *standardized* components for your customized installation.





Aluminum putty

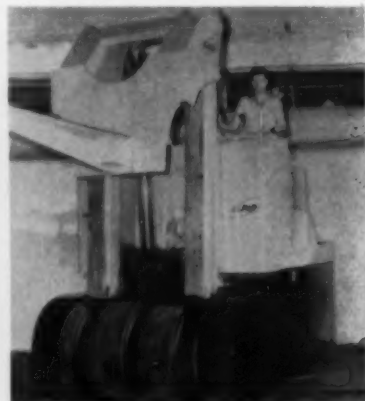
Devcon F, consisting of approximately 80% aluminum and 20% plastic is designed for filling very large and small holes in aluminum and steel castings, to cover holes which have been drilled incorrectly and to build up worn sections. The material has an excellent adherence to aluminum and steel. *Chemical Development Corp.*

For more data circle No. 29 on postcard, p. 133

NEW EQUIPMENT

Ram trucks

Designed for heavy-duty coil handling equipment, a series of ram trucks has capacities ranging from 20,000 to 80,000 lbs. Features of the line include dual power plants with separate drive motors and reduction units for each pair of drive wheels, maximum motor protection with drive motors lo-



cated inside the frame, special narrow width design for operation in confined areas, dual lift cylinders and power operated hydraulic brakes in drive wheels. Trucks also feature power steering, deadman control and caster steering. *Elwell-Parker Electric Co.*

For more data circle No. 40 on postcard, p. 133

ONE SINGLE LEVER CONTROLS THIS POWERFUL

WAGNER

COLD SAWING MACHINE

Providing Efficiencies
Heretofore Unknown.

Capacities Up
To 27" Rounds.

Other Shapes In Proportion.

For Complete Details On

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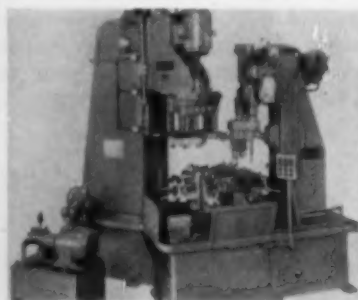


KLINGELHOFER

MACHINE TOOL COMPANY
Sole Distributor
Industrial Park Kenilworth, N. J.

Horizontal indexing

Special purpose four station horizontal indexing machine employs standard machine components for drilling, chamfering, spotfacing and tapping operations on forged



steel steering knuckles. Reported production of the machine is 60 finished steering knuckles per hour at 100 per cent efficiency. *Hartford Special Machinery Co.*

For more data circle No. 41 on postcard, p. 133

Hand comparator

Surface comparator permits metal surfaces of mass-produced parts to be compared with a selected standard for roughness under 10-power magnification. Designed to speed up the work of set-up and production men and quality control inspectors, the comparator is a pocket-sized, hand-held instrument

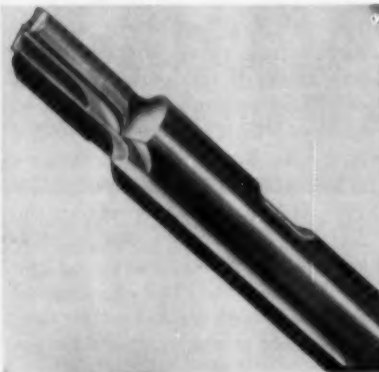


which operates on a unique optical principle which emphasizes surface irregularities. By illuminating the known standard and the piece under study at the same time, it enables a quick comparison to be made. *Bausch & Lomb Optical Co.*

For more data circle No. 42 on postcard, p. 133

End mills

Small diameter carbide tipped end mills have specially heat treated tool steel bodies preventing tendency for the shank to snap at thinnest point. These 1/4-in. and



5/16-in. end mills are reported not only to eliminate snapping, but also provide additional shank rigidity to reduce operational vibration and promote increased accuracy. *Nelco Tool Co., Inc.*

For more data circle No. 43 on postcard, p. 133

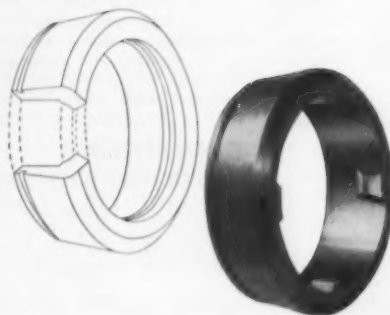


NEW EQUIPMENT

Lubricating kit

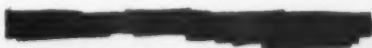
A boxed assortment provides 95 oil cups of 29 different types for maintenance and replacement use. Each type of oiler comes in its own separate bin within the kit. The contents of each bin are fully and clearly described on the inside of the cover. This Lubrikit is said to save money, simplify problems. *Gits Bros. Mfg. Co.*

For more data circle No. 44 on postcard, p. 133



**I. D. and four
inverted helical splines
BROACHED
the American way**

... 300 parts per hour



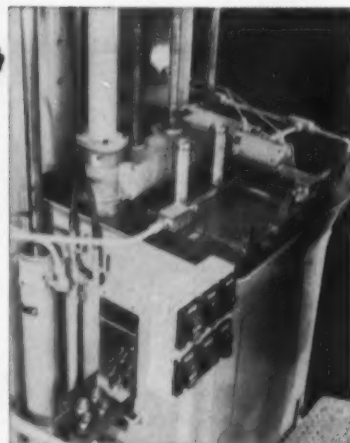
American engineering made this broaching operation fast, automatic and economical.

The finished inside diameter and four inverted helical splines are broached, in this automotive synchronizer ring, two at a time ... 300 per hour.

American special combination round and spiral spline broaches are used to cut the splines concentric with the I.D.

Feed tubes are here shown as manually loaded but are readily adapted to automation. Parts are fed and ejected by automatic hydraulic slides.

You may have parts that can be produced at significantly lower cost by broaching them the American way. Send part print or sample ... American engineers will make a recommendation you'll find valuable.



American Catalog 450 is a complete broaching manual ... write for it today.



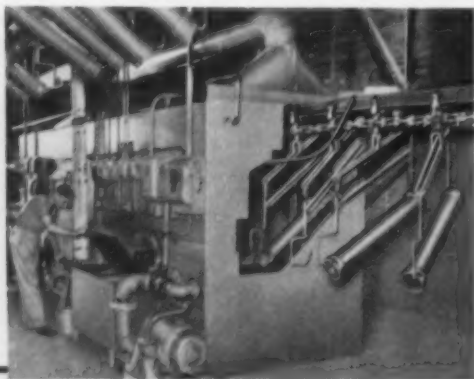
American BROACH & MACHINE CO.
A DIVISION OF SUNSTRAND MACHINE TOOL CO.

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See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery



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JOB-ENGINEERS
INTEGRATED
CONVEYING and
PROCESSING
SYSTEMS
TO MEET
YOUR
PLANT
REQUIREMENTS**



**WHY order a Conveying System from one company—
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INTEGRATED A-F FACILITIES are at your service. Alvey-Ferguson is unique among all manufacturers in being able to offer you a Conveying System completely co-ordinated with your Cleaning and Processing Machines... all A-F Engineered to your plant's requirements.

BEFORE YOU ORDER, write us. Let us prove how the integration of an A-F Engineered Overhead Trolley Conveyor System with A-F Engineered Cleaning and Processing Machines will move metal parts and products through your plant at the most efficient pre-determined rate of speed for "quality control" and lowest cost production. Write, without obligation, for new A-F brochures—today.



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Also Pre-Engineered Conveyors—
Wheel, Trolley, Roller, Belt
Metal Cleaning and Processing Machines

THE ALVEY-FERGUSON CO., 560 Disney St., CINCINNATI 9, OHIO and Azusa, California

**This 25-TON Hannifin
Straightening Press Sells For**

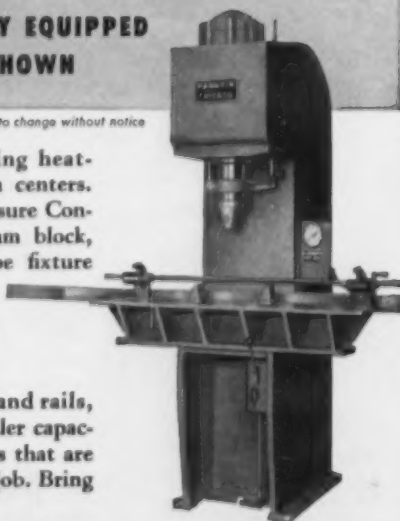
**\$4,179 FULLY EQUIPPED
AS SHOWN**

Price F.O.B. our press plant at St. Marys, Ohio, subject to change without notice

The ideal press for straightening heat-treated parts up to 60" between centers. Exclusive Hannifin Sensitive Pressure Control for speed and accuracy. Ram block, two table blocks and center-type fixture complete with rails included.

**STRAIGHTENING PRESSES
FROM 5 TO 150 TONS**

Hannifin offers longer tables and rails, roller-type fixtures, larger or smaller capacities (5 to 150 tons)—all at prices that are easily justified by savings on the job. Bring us your straightening problems.



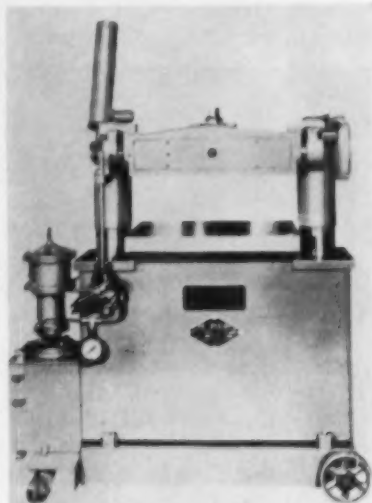
HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

NEW EQUIPMENT

Die tryout press

A new die tryout press of 50 or 75 ton capacity operates either air-draulically or hydraulically. The head can be released and rotated to any point up to 240°. The base houses two hydraulic cylinders.



Tonnage of the airdraulically operated press is based upon 80-lb air pressure. Both models are mobile. Both permit die members to be barbered, sheared, fitted and finished without removal from the press. *Alpha Tool Works.*

For more data circle No. 45 on postcard, p. 133

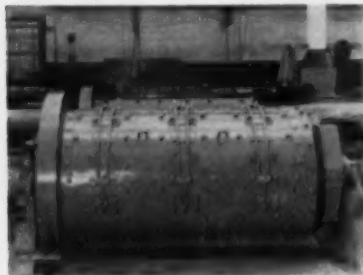
High volume output

An efficient heat exchanger and a powerful pumping system account for the high volume output of the new Model K line of steam cleaners. These compact units—gas or oil fired—feature capacities to 300 gph. A Kelite heat exchanger raises the water temperature to 100° before the water enters the main heating circuit. Automotive-type piston pump runs in oil and has stainless steel ball check valves to provide high volume output and dependable operation. A device automatically maintains the strength of the cleaning solution at the desired pH. Straight-line cabinet requires no clay or firebrick and is louvered for adequate ventilation. All controls are on the front of the cabinet. *Kelite Products, Inc.*

For more data circle No. 46 on postcard, p. 133

Tumbling mills

Line of tumbling mills is said to be 90 pct quieter than conventional mills. Sound reduction is accomplished in two ways: specially designed sound-deadener of $\frac{3}{4}$ -in. thick Neoprene rubber is fastened to the inside of the tumbler shell



and drive noise has been reduced by the use of precision-machined semi-steel gears and pinions. Mills are available in a wide range of sizes in diameters from 24 in. to 48 in. and in capacities from 9 to 92 cu ft. Other features: sure-holding doors, motor platform, extra-heavy duty gear-head motor and magnetic brake. *W. W. Sly Mfg. Co.*

For more data circle No. 47 on postcard, p. 133



Filter unit

For use on skin-planers, spar profilers and other large hydraulically operated machine tools requiring the fluid pressures and flow rates necessary for high speed operation, filter can separate micron size particles from hydraulic fluids at pressures of 1000 psi, handling flow rates to 75 gpm. *Purolator Products, Inc.*

For more data circle No. 48 on postcard, p. 133

Cutoff machine

A new 5 hp cutoff unit handles steel barstock in 1-in. diam rounds or equivalent area, or two in. diam $\frac{1}{8}$ -in. wall tubing. The unit incorporates special shim-adjusted bearing-mounted spindle and trun-



nion. Motor maintains cutting wheel speed and is adjustably mounted for proper drive belt tension. *Tabor Mfg. Co.*

For more data circle No. 49 on postcard, p. 133



more and more
manufacturers are saying-

"Let's use
GRIFFIN
COLD ROLLED STRIP STEEL"

Made to your specifications in all thicknesses from .002 to .375 inches and widths from $\frac{1}{2}$ " to 19" depending upon gauge.

Heavier gauges to special order.

NARROW ROLLED ROUND
EDGE STRIP STEEL

In stock at
CENTRAL STEEL & WIRE CO.
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Call or Write
GRIFFIN
"Since 1899"

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For further information, write 150 Canal Street

CLARK BROS BOLT CO.
MILDALE CONN.

FACTS THAT FIGURE in lower costs

FACT:

Steel is two to three times as strong as gray iron.



FACT:

Steel is two and one half times more rigid than gray iron.



FACT:

Steel costs only a third as much as gray iron.



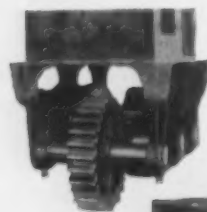
AND SO... by manufacturing your products from welded steel, costs can be reduced on average of 80%.

WHEN a machine design makes the most efficient use of steel, material costs can be reduced as much as 85% over gray iron. That's because only one half to one third as much metal is needed. Each pound of metal costs a third as much as iron.

Taking advantage of the large initial saving in material cost, today's manufacturer has a wide margin in which to fabricate his products by welding.

With proper design to utilize the advantages of steel's superior properties and fast, modern welding techniques, many machine components can be produced at such low costs that overall savings can average as much as 50%.

The manufacturer of this transmission housing saves \$285.99 on each unit . . . a 45% reduction in cost. In addition to material savings, machining is simpler since less stock needs to be left on for machining.



Original Construction
Cost \$664.33

Present Welded Steel Design
Cost \$378.34



MORE FACTS ON DESIGN

Latent data on design for welding available to designers and production engineers. Write on your letterhead.

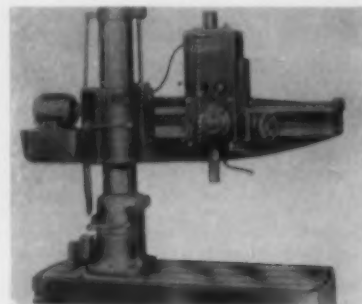
THE LINCOLN ELECTRIC COMPANY

Dept. 1511 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

Flame-hardened columns

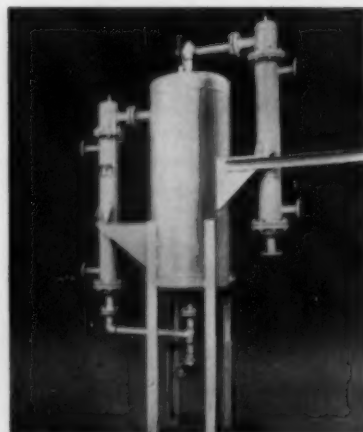
Large-size flame-hardened columns for radial drills are now available. Supplied in 9-in. and 11-in. columns as a protection against scoring they were developed after several years research work. The manufacturer reports that the special alloy castings for the 5-ft columns were



finish turned, then flame hardened to 52-56 Rc for a depth of 1/16-in. to 3/32-in. and finally finish ground to close tolerances for straightness, roundness and high finish. Cincinnati Gilbert Machine Tool Co.

For more data circle No. 50 on postcard, p. 133

NEW EQUIPMENT



Solvent reclaiming

A solvent reclaiming still, available for either batch or semi-continuous operation, has been designed to eliminate impurities in solvents and allow their re-use. The heating medium is steam, with water required for use in the solvent condenser. The unit is made in five sizes. Struthers Wells Corp.

For more data circle No. 51 on postcard, p. 133

Perforations perplexing you?

MASONITE
PLASTIC
METALS
RUBBER



If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using . . . whether it's metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes, you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

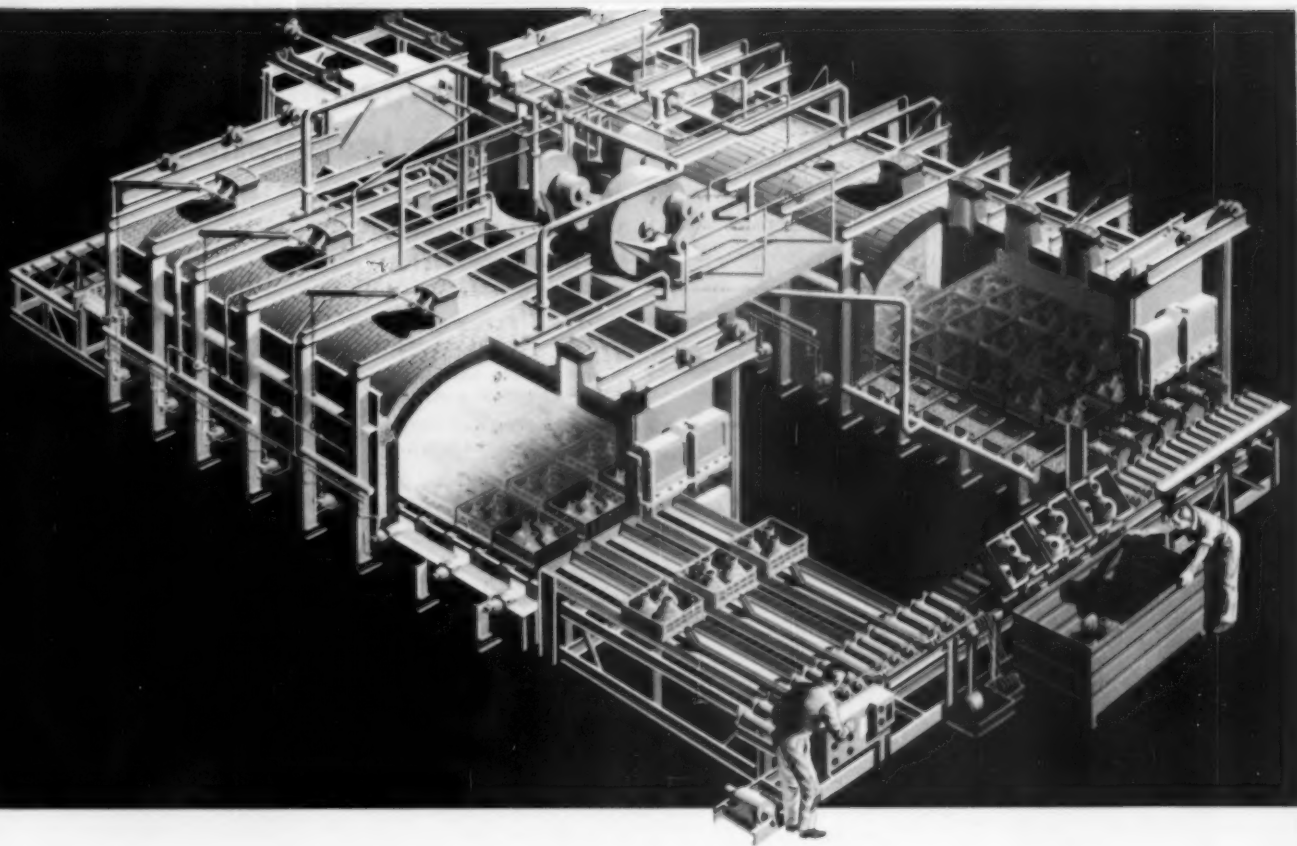
...better call **HENDRICK**

Hendrick
MANUFACTURING COMPANY



37 DUNDAFF ST., CARBONDALE, PA. • Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Wedge Wire
Architectural Grilles • Nitco-Open Steel Flooring • Shur-Site Treads • Armorgrids



► You get automatic, precise heat treatment plus high production with this Salem-Brosius furnace

You speed production—control heat treating cycles to close limits—achieve specified metallurgical and physical properties in forged parts with this Salem-Brosius furnace.

This is possible because time, temperature and material movement are automatically controlled to provide precise cycle annealing practice. Rugged construction and simplified design give you efficient operation with low maintenance.

Here is a typical cycle. Forged alloy steel automotive parts, such as clutch plates and drive pinions, are loaded into three trays and positioned in front of the furnace pusher on the left. The furnace takes over.

The trays move automatically into the heat and soak chamber where the parts are heated to 1700°F. and held at that temperature for a timed interval. Then they move to the next section and are control-cooled to 1200°F. at which moment they move to the final zone and are con-

trol-cooled to 500°F. At this time the trays are ejected to a transfer table from which they are automatically emptied into tote boxes.

An ingenious arrangement of recording controllers, fuel regulators, thermocouples, and air control valves automatically hold the temperature to within extremely close limits. Yet this precise furnace anneals as much as 4000 pounds of forgings per hour.

This furnace is typical of the efficient heat treating and heating furnaces designed and built by Salem-Brosius to increase your production and reduce your unit costs. The skill and experience of Salem-Brosius engineers recently were augmented by the acquisition of the George J. Hagan Company so that now you get the benefit of the combined abilities of both organizations to design, engineer and build fine furnaces when you specify Salem-Brosius. Write to us!

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

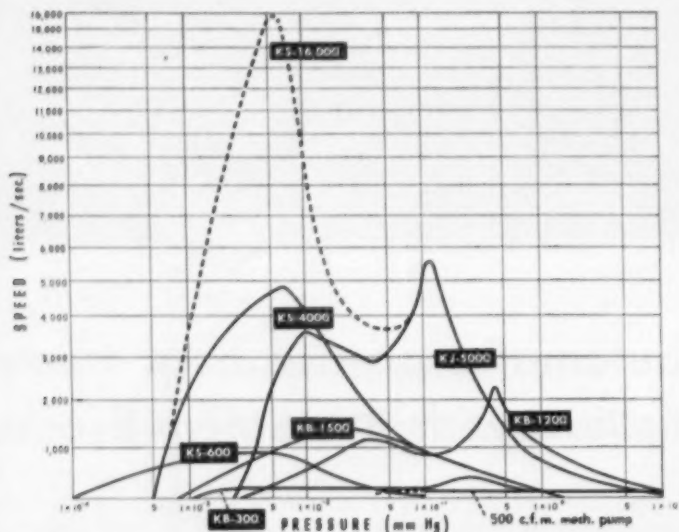
IN CANADA: SALEM ENGINEERING LTD. - 1525 BLOOR STREET WEST, TORONTO 7, ONTARIO

These **CVC** pumps ...

are working in these vacuum metallurgy installations

- KB-300 → Titanium Sponge Production
- KS-600 → 5-50 lb. Melting and Casting
- KB-1200 → 1000 lb. Consumable Electrode Arc Melting
- KB-1500 → Multi-Batch Carbide Sintering
- KS-4000 → 350-500 lb. Melting and Casting and Arc Melting 8" dia. ingots
- KJ-5000 → 1000 lb. Melting and Casting at 3 to 25 microns pressure
- KS-16,000 → 1000 lb. Melting and Casting at 0.8 to 15 microns pressure

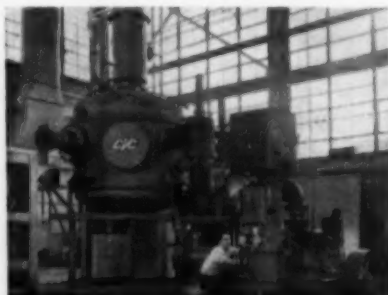
and here's how they work



If you work or plan to work in vacuum metallurgy, you can profit by CVC's practical experience in the field.

CVC is currently designing, building and installing high vacuum furnaces which solve many unusual problems. The wide range of pumps used in these installations and the know-how we have obtained from our work with them can go far in helping to solve your problems.

We welcome the opportunity to discuss high vacuum metallurgy with you. For further information and a copy of our "Information Memo" on High Vacuum Metallurgy write to Consolidated Vacuum Corporation, Rochester 3, N. Y. (a subsidiary of Consolidated Engineering Corporation, Pasadena, California).



This 1000-lb. high vacuum melting and casting furnace is an example of efficient, economical design. The buyer is starting with 350-lb. melts. The 4800 liters-per-sec. speed of a

single KS-4000 pump is more than adequate for 350-lb. melts (see graph). When he's ready for 1000-lb. melts, he simply adds another KS-4000 pump and a 1000-lb. coil and crucible.



Headquarters
for High Vacuum

Consolidated Vacuum Corporation

ROCHESTER 3, N.Y.

CVC sales now handled through Consolidated Engineering Corporation with offices located in: Albuquerque • Atlanta • Boston • Buffalo • Chicago • Dallas • Detroit • New York • Palo Alto • Pasadena • Philadelphia • Seattle • Washington, D. C.

The Iron Age SUMMARY . . .

Scramble for conversion is on . . . Desperate consumers pay up to \$100 a ton for ingots . . . Steel shortage limits production . . . Scrap price climbs.

It's Really Tough . . . The steel shortage is even worse than it appears on the surface. And that's pretty bad. The scramble for steel has developed into a grim life-or-death struggle for many consumers.

Despite everything the mills are doing to step up production, the situation is deteriorating. Steel is where you find it for companies large or small. And that includes high-cost conversion, buying from so-called steel brokers, and barter deals.

Lack of steel is imposing a limit on what many companies can produce, and this in turn restricts the amount of business they can accept. For them and others, steel procurement is the worst nightmare since the Korean war.

Conversion deals involving thousands of tons are kicking around the country looking for a home. Products involved include sheets, plates, and bars. Some mills have about all the conversion tonnage they can handle. They're expensive for the consumer, but nevertheless the better of two evils when the alternative is to slow down or shut down a production line.

Conversion Costs Plenty . . . For the company that wants to make a conversion deal, ingot costs

range up to \$100 a ton—slightly less than double the regular mill price. Slabs, second step in the steel production cycle, are going for \$110 f. o. b., compared with the mill price of around \$68.50. By the time the steel user gets the sheets he needs, he's paid a price that has no resemblance to the going mill price.

The growing volume of conversion tonnages is posing a threat to efforts of the mills to hold down steel scrap prices. Mills knee deep in conversion include electric furnace shops and other producers who will require heavy tonnages of steelmaking scrap grades. To obtain their requirements, they will be inclined to bid up scrap prices.

Scrap Problem . . . Higher scrap prices in turn increase the pressure on finished steel prices. Several mills have already pointed to high cost of scrap as one of several factors that forced them to increase prices of some steel products. If scrap prices go through the roof during the coming winter, as some fear, more companies may be forced to take another look at their finished steel price structure.

Record-breaking scrap export demand is another factor in the threatening scrap price crisis.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
2,413	2,400	2,340	1,918	
Ingot Index (1947-1949=100)	150.0	149.5	145.5	119.2
Operating Rates				
Chicago	98.0	99.0*	98.5	85.0
Pittsburgh	103.0	102.0*	102.0	75.0
Philadelphia	102.0	103.5	103.0	70.0
Valley	103.0	101.0*	100.0	78.0
West	98.0	96.0*	91.0	81.5
Detroit	96.0	95.0	98.0	88.0
Buffalo	105.0	105.0	105.0	97.5
Cleveland	100.0	103.0*	105.0	80.0
Birmingham	94.5	94.0	97.5	63.5
S. Ohio River	92.0	87.3*	86.0	85.0
Wheeling	103.0	103.0*	104.0	97.0
St. Louis	98.0	97.0	106.0	84.0
Northeast	97.0	97.0	92.0	68.0
Aggregate	100.0	99.5	97.0	79.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.797
Pig Iron (Gross Ton)	\$59.09	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy (gross ton)	\$45.17	\$44.83	\$44.17	\$33.83
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	22.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.30	15.30	15.30	14.80
Magnesium	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	63.08
Tin, Straits, N. Y.	96.875	96.25	96.125	91.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.50

Strip Joins Tight Item List

Hot-rolled, cold-rolled strip will get even tighter next half . . . Consumers are resorting to more trading deals in sheet . . . October steel output sets a record.

♦ **LOOK FOR** both hot-rolled and cold-rolled strip to join the growing list of scarcer-than-hen's-teeth products during first half of '56.

Guesses by producers and consumers are that cold-rolled strip availability in particular will hit a low point in second quarter.

It's no secret that a number of customers are already trading sheet, and that some conversion of ingot to hot-rolled sheet is now going on. So far, however, it's been difficult to find any successful attempts by consumers to convert hot-rolled sheet to cold-rolled sheet. There just isn't any cold-rolling mill space open.

Forecast of further trouble ahead in both sheet and strip availability is showing up currently in large midwestern consumers' purchases of out-of-area sheet and their search for out-of-area conversion space. Heavy item in trading is sheet for light plate.

With cold-rolled strip already sold out for first quarter '56, producers in the Chicago area, and those in other areas where order books are just now opening, are reticent about making delivery commitments for second quarter. Reason is that nobody knows if there will be enough hot-rolled strip available to keep cold-rolled strip quotas up to first quarter levels.

Claims by some producers that they expect to be current on sheet, strip, plate, and structurals by the end of first quarter are being viewed with a jaundiced eye by customers in general. Similar claims made earlier in the year following institution of production "catch up" months failed to bear up.

Right now, sheet and strip carryovers for many producers are running anywhere from two to three months on sheet, at least a month

in strip. Before things get better, it's almost a sure bet, they'll get somewhat worse.

American Iron & Steel Institute reports that October steel output set a new monthly record of 10,502,000 net tons of ingots and steel for castings.

The record boosted production for the first 10 months of the year to a new high of 96,286,118 tons. Previous record for the period was in 1953 at 94,973,339 tons. Last year for the same period output came to 71,935,152 tons.

SHEETS AND STRIP . . . One large eastern producer has just opened 1st quarter books on hot-rolled strip, hasn't as yet made a similar move on sheet. This producer is scanning all orders carefully, and, like Chicago producers, is pessimistic on delivery time by end of 1st, and entire 2nd quarters. Even with additional time set aside for delivery "catch up", mid-west mills see little hope of snapping up the current 60 to 90 carryover time on sheet, or the 30-day backtime on strip. Even Pittsburgh deliveries continue to run 10 to 12 weeks late and customer inventories are at rock bot-

tom. Warehouses will continue to sell all grades of sheet until their shelves are bare. Pittsburgh dealers report consumers are buying off sizes and gages of sheet, adapting these to their production. Despite scattered predictions that automakers will be cutting back orders after January, pressure continues in Detroit for sheet and strip, order backlogs are piling up.

GALVANIZED . . . Chicago mills will continue quota system on deliveries during first half '56. Despite the government's grain bin program, a few mills are pointing with pride to the minimum carryover time which will prevail going into the new year. New production lines coming into operation are helping in the over-all delivery pattern.

BARS . . . Brisk automotive demand has all grades of bars moving fast on the West Coast. There's a 30-day carryover on hot-rolled bars in Chicago, with hot finished bars available for delivery as early as February. Alloy and carbon bars are tight, however, with deliveries in some cases extending to 3rd quarter. In the East, a large producer has just opened order books for 1st quarter hot-rolled bars, expects carryovers of at least 6 weeks running from 4th to 1st quarter. Carbon bar is in heaviest demand in Detroit, reflecting a concentration on production of alloys. Pittsburgh bar producers are already sold out for 1st quarter, with 50 pct of orders carryovers from this year.

PLATE . . . Producers in Detroit and Pittsburgh see nothing but heavy carryovers on light and heavy plate going into next quarter. In the latter district, these will amount to at least 10 weeks or better. Cleveland and other Ohio plate consumers are feeling the pinch on plate since only token tonnage is produced in the area. Some are going to Europe and Japan in attempts to place orders at up to \$35 per ton premium. Japanese mills have offered next June delivery on plates at \$155 per ton delivered to Northern Ohio compared to domestic at \$120 a ton. German mills were unable to accept orders. Domestic plate deliveries are running 6 to 8 weeks behind from Pittsburgh and Delaware Valley points, major suppliers to Ohio. Carryovers on wide plate in Chicago run at least 60 days. Some consumers expect a carryover of at least 30 days at the end of 1st quarter. Some warehouse stocks are off 50 pct of desired tonnage.

Purchasing Agent's Checklist:

SCRAP: Is there a crisis looming ahead? p. 71

TAXES: Don't look for further write-offs for steel expansion . . . p. 75

COLOR: Find wide possibilities for color-bearing metals p. 78

WIRE: Stepped up demand for wire will continue next year. . . . p. 80

TECHNICAL: Cold forming cuts production costs, takes less metal, fewer operations p. 111

Comparison of Prices

(Effective Nov. 15, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland and Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Nov. 15 1955	Nov. 8 1955	Oct. 18 1955	Nov. 16 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.79
Plate	4.52	4.52	4.52	4.25
Plates wrought iron	9.30	9.30	9.30	9.30
Stain's C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$9.05
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.75
Special coated mfg. ternes	7.85	7.85	7.85	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢
Cold finished bars	5.50	5.50	5.50	5.40
Alloy bars	5.85	5.85	5.85	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.45
Light rails	5.65	5.65	5.65	5.35
Semi-finish Steel: (per net ton)				
Revolving billets	\$68.50	\$68.50	\$68.50	\$64.00
Slabs, re-rolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.707¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Nov. 15 1955	Nov. 8 1955	Oct. 18 1955	Nov. 16 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$63.69	\$63.69	\$63.69	\$61.19
Foundry, Valley	69.00	69.00	69.00	66.50
Foundry, Southern, Cin'ti	62.98	62.98	62.98	60.48
Foundry, Birmingham	58.00	58.00	58.00	55.50
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.80	58.80	58.80	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74-78 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	\$59.00	\$59.00	\$59.00	\$56.50
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$45.50	\$45.50	\$44.50	\$35.50
No. 1 steel, Phila. area	46.50	46.50	46.50	35.00
No. 1 steel, Chicago	43.50	42.50	43.50	33.50
No. 1 bundles, Detroit	49.00	39.00	39.00	27.50
Low phos., Youngstown	49.00	49.00	49.00	35.50
No. 1 mach'y cast, Pittsburgh	52.50	50.50	49.50	42.50
No. 1 mach'y cast, Philadelf'a.	48.50	48.50	47.50	42.50
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$45.17	\$44.83	\$44.83	\$33.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.25	\$13.25	\$13.25	\$14.50
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	48.00	48.00	48.00	50.00
Copper, Lake, Conn.	48.00	48.00	48.00	50.00
Tin, Straits, New York	96.875¢	96.25¢	96.125	91.00
Zinc, East St. Louis	13.00	13.00	13.00	11.60
Lead, St. Louis	15.30	15.30	15.30	14.80
Aluminum, virgin ingot	24.40	24.40	24.40	23.20
Nickel, electrolytic	64.50	64.50	64.50	62.50
Magnesium, ingot	88.25	88.25	88.25	77.75
Antimony, Laredo, Tex.	88.00	88.00	88.00	88.50
† Tentative. ‡ Average. * Revised.				

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on P. 100 →

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Bethlehem B3	60.50	61.00	61.50	62.00	.....
Hudon, Pa. B6	60.50	61.00	61.50	62.00	.....
Birmingham R3	54.50	55.00	55.00	55.00	.....
Birmingham H9	54.50	55.00	55.00	55.00	.....
Birmingham U4	54.50	55.00	55.00	55.00	.....
Buffalo R3	58.50	59.00	59.50	59.50	.....
Buffalo H1	58.50	59.00	59.50	59.50	.....
Buffalo W6	58.50	59.00	59.50	60.00	.....
Chester C7	60.50	61.00	61.50	.....	.....
Chicago 14	58.50	59.00	59.00	59.50	.....
Cleveland A5	58.50	59.00	59.00	59.50	63.50
Cleveland R3	58.50	59.00	59.00	59.50	.....
Detroit 14	58.50	59.00	59.00	59.50	.....
Erie 14	58.50	59.00	59.00	59.50	.....
Everett M6	.....	61.00	61.50	.....	.....
Fantana K1	64.50	65.00	.....	.....	.....
Genora, Utah C7	58.50	59.00	.....	.....	.....
Granite City G2	60.40	60.90	61.40	.....	.....
Hubbard Y1	.....	59.00	.....	.....	.....
Lane Star L3	.....	55.00	.....	.....	.....
Minnequa C6	60.50	61.00	61.50	.....	.....
Monaca P6	58.50	59.00	59.00	59.50	.....
Neville 14 P4	58.50	59.00	59.00	59.50	.....
N. Tonawanda T1	.....	59.00	59.50	.....	.....
Pittsburgh U1	58.50	59.00	59.00	59.50	.....
Sharpville S3	58.50	59.00	59.00	59.50	.....
So. Chicago R3	58.50	59.00	59.00	59.50	.....
Stedon B3	60.50	61.00	61.50	62.00	66.50
Swedeland A2	60.50	61.00	61.50	62.00	.....
Takela 14	58.50	59.00	59.00	59.50	.....
Troy, N. Y. R3	60.50	61.00	61.50	62.00	66.50
Youngstown Y1	.....	59.00	59.50	.....	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, 32¢ per ton for 0.5 to 0.75 pct nickel, 31¢ for each additional, 0.25 pct nickel. *Add \$1.00 for 0.31-0.60 pct phos.

Silvery Iron: Buffalo, H1, \$68.75; Jackson, J1, G1, \$67.50. Add \$1.00 per ton for each 0.50 pct silicon over base (0.91 to 0.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.8 pct. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	348	410	416	430
Ingot, re-rolling	17.75	19.00	—	26.25	31.50	25.00	33.75	19.00	—	15.25
Slabs, billets, re-rolling	22.25	24.75	26.75	34.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	50.25	44.25	50.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A5; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W1, J3; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D3.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher); W1 (25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, J4; Philadelphia, D3; Detroit, R3.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monaca, P6; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Cantonville, Pa., C15; Philadelphia, D3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R3.

Chicago Prices Move Up Again

Area reports advances in steelmaking and railroad grades . . . Heavy mill buying due . . . Detroit and Boston report new gains . . . Composite up 34¢.

◆ **PRICES** of steelmaking and railroad grades are up \$1 in Chicago.

The area reports growing strength with broker buying figures up and fresh mill orders expected in the near future.

Elsewhere prices are holding or advancing. In Detroit, the best steelmaking grades advanced \$1. Boston reports broad advances, with cast grades jumping.

Pittsburgh remains the quiet spot in a market that shows signs of new life. Railroad grades made scattered gains and foundry items showed good strength but openhearth scrap continues to stand still.

In the East, prices are holding for the most part. Activity is steady but there is no buildup of scrap by dealers or the mills.

Reflecting the Chicago increase, **THE IRON AGE** No. 1 heavy melting composite moved up 34¢ to \$45.17.

Pittsburgh . . . Activity in the openhearth scrap market remains unchanged without a substantial sale to accurately peg the market. Sales of the past couple of months have been of very limited tonnages within a dollar or two of current prices. The mills continue to remain out of the market and are not expected to come in before December. Heavy foundry business has caused cast grades to move higher with No. 1 machinery cast at \$53 and heavy breakable cast up to \$44. Scrap rails, random length and rail specialties have advanced \$1 a ton, reflecting the effects of the latest railroad lists. Other grades are unchanged.

Chicago . . . The Chicago market indicated growing strength last week with heavier mill buying anticipated in the near future. While turning grades continued to hold, advances were scored in steelmaking and rail-

road grades and the entire market had a very strong tone. Broker buying of No. 1 heavy melting was as strong as \$44 and No. 1 dealer bundles had previously moved at that price. Factory bundles had already been bid over the consumer purchase price the week previous. Further advances, particularly in the railroad grades, are expected. Despite the normal slowdown of the foundry grades at this season, cast grades show considerable strength though few gains were reported.

Philadelphia . . . A shot in the arm was given to railroad specialties, advancing the price of steel wheels and spring steel \$1 a ton. Additional strength is also shown in malleable with a \$1.50 advance on the topside over last week's listing. Elsewhere, top steelmaking and blast furnace grades are holding firm with dealers reporting a pickup in yard in-and-out traffic over the past week. Brisk port activity continues with an outbound vessel slated to depart shortly with a load of unstripped motor blocks. Further strength in the cast market is expected to materialize at the market level shortly.

New York . . . Business continues good to excellent in this area. Prices are strong with turnings up \$1 on all grades. Exports continue to play an important role in bolstering this market with domestic consumer matching export quotations to secure material. The trade is very optimistic about future business, seeing a distinct possibility of higher prices.

Detroit . . . Indications of strengthening market popped up in Detroit this week as broker buying prices for No. 1 grades advanced on the average of \$1. Blast furnace and foundry grades remained the same. The market is expected to stay firm until the December automotive lists come out in about ten days.

Cleveland . . . Dealers are enjoying a seller's market in top foundry grades with some rural foundries paying up to \$54-55 for spot carloads

of foundry steel scrap. Prices remain steady in Cleveland because large tonnages of good foundry grades are not available and higher prices would produce only a few carloads. Top steelmaking grades remain quiet in Cleveland and the Valley although some brokers are having trouble covering older fringe area orders.

Birmingham . . . In the past, Republic Steel Corp. has been the only consumer of No. 2 steel bundles in this district, but because of the shortage of electric furnace bundles in this area, Connors Steel Division of the H. K. Porter Co. has now become a buyer of No. 2 bundles. Some dealers are holding scrap for inventory purposes, which is causing additional pressure on the market. There are numerous reports in the market of higher prices being paid for special lots and special steel-making grades, but generally prices are unchanged for both steel making and cast items.

St. Louis . . . Foundries in the St. Louis industrial district are enjoying good business, resulting in a strong demand for cast iron grades, especially cupola cast which is \$1 higher. The market continues strong as consumers are busy and the receipts are about equal to the melt.

Cincinnati . . . For the first time in months a local mill's new prices at \$1-2 under prevailing market were rejected by local dealers last week. Out-of-town sources, now shipping in on springboard, will either have tonnage increased or local prices will rise. Scrap for foundries continues tight with low phos plate going for up to \$53 delivered. With dealers resisting attempts to lower local prices and heavy out-of-town buying in progress an upsurge in December buying and prices is in the making.

Buffalo . . . No. 1 heavy melting is up \$1 on the basis of recent small purchases, and a major area mill is expected to place new orders this week.

Boston . . . Moderate activity here confirmed or improved prices of most grades. No. 1 heavy melting is up \$2.50. Machine shop turnings and shoveling turnings advanced \$1 to \$1.50. No. 1 machinery cast took a big jump to \$38.00.

West Coast . . . Scrap market is quiet. Prices are holding steady. With a lull this week in San Francisco exporting activities, mills are having less trouble making their melt. Exporting in Los Angeles is still at a fast clip.



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Scrap Prices (Effective Nov. 16, 1955)

Pittsburgh

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and ms. turns.	30.00 to 31.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. punch'gs, plate	49.00 to 50.00
Heavy turnings	42.00 to 43.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	55.00 to 56.00
Rails 2 ft and under	59.00 to 60.00
RR. steel wheels	54.00 to 55.00
RR. spring steel	54.00 to 55.00
RR. couplers and knuckles	54.00 to 55.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	43.00 to 44.00

Chicago

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 factory bundles	47.00 to 48.00
No. 1 dealers' bundles	43.00 to 44.00
No. 2 dealers' bundles	34.00 to 35.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs, plate	49.00 to 50.00
Low phos. 3 ft and under	48.00 to 49.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	57.00 to 58.00
Re-rolling rails	66.00 to 68.00
Rails 2 ft and under	62.00 to 63.00
Locomotive tires, cut	52.00 to 53.00
Cut bolsters & side frames	53.00 to 54.00
Angles and splice bars	59.00 to 60.00
RR. steel car axles	59.00 to 60.00
RR. couplers and knuckles	53.00 to 54.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	49.00 to 50.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	46.00 to 48.00
Malleable	57.00 to 58.00
Stove plate	40.00 to 41.00

Philadelphia Area

No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	28.50 to 29.50
Mixed bor. short turn.	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	35.00 to 36.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft and under	49.00 to 50.00
Low phos. punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	52.00 to 53.00
RR. spring steel	52.00 to 53.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast.	42.00 to 44.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	52.00 to 53.00
Malleable	59.50 to 60.50
Unstripped motor blocks	29.00 to 31.00
No. 1 machinery cast.	48.00 to 49.00

Cleveland

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	36.00 to 37.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	28.50 to 29.50
Shoveling turnings	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Cut struct'l & plates, 2 ft & under	51.00 to 52.00
Drop forge flashings	44.00 to 45.00
Low phos. punch'gs, plate	46.00 to 47.00
Foundry steel, 2 ft & under	50.00 to 51.00
No. 1 RR. heavy melting	48.50 to 49.50
Rails 2 ft and under	61.00 to 62.00
Rails 18 in. and under	62.00 to 63.00
Railroad gate bars	37.00 to 38.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$47.50 to \$48.50
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	47.50 to 48.50
No. 2 bundles	36.00 to 37.00
Machine shop turn.	27.50 to 28.50
Shoveling turnings	31.50 to 32.50
Cast iron borings	31.50 to 32.50
Low phos. plate	48.50 to 49.50

Buffalo

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 busheling	41.00 to 42.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	62.00 to 63.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$39.50 to \$40.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	39.50 to 40.50
No. 3 bundles	27.00 to 28.00
New busheling	39.50 to 40.50
Drop forge flashings	39.00 to 40.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs, plate	39.50 to 40.50
No. 1 cupola cast.	40.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	43.00 to 44.00

St. Louis

No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	27.00 to 28.00
Cast iron borings	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
No. 1 RR. hvy. melting	46.00 to 47.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	59.00 to 60.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	49.00 to 50.00
RR. specialties	50.00 to 51.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	48.00 to 49.50
Unstripped motor blocks	37.00 to 38.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	33.00 to 33.50
No. 1 bundles	39.00
No. 2 bundles	28.00 to 28.50
No. 1 busheling	39.00
Elec. furnace, 3 ft & under	40.00 to 41.00
Machine shop turn.	21.00 to 21.50
Mixed bor. and short turn.	22.00 to 23.00
Shoveling turnings	24.00 to 24.50
Clean cast chem. borings	23.00 to 24.00
No. 1 machinery cast.	37.00 to 38.00
Mixed cupola cast.	32.00 to 34.00
Heavy breakable cast.	34.50 to 35.00
Stove plate	31.00 to 32.00
Unstripped motor blocks	18.00 to 19.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$41.50 to \$42.50
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	39.00 to 40.00
Charging box cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Unstripped motor blocks	25.00 to 26.00

Birmingham

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	43.00 to 44.00
Bar crops and plate	47.00 to 48.00
Structural and plate, 2 ft.	46.00 to 47.00
No. 1 RR. hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	53.00 to 54.00
Rails, 18 in. and under	58.50 to 59.50
Angles & splice bars	55.00 to 56.00
Re-rolling rails	58.00 to 59.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	30.00 to 31.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	35.50 to 36.50
No. 1 bundles	42.00 to 43.00
No. 3 bundles	33.00 to 34.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	31.50 to 32.50
Cast iron borings	25.00 to 26.00
Low phos. 18 in. & under	50.00 to 51.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	60.00 to 61.00
No. 1 cupola cast.	43.00 to 44.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	\$39.00
No. 2 hvy. melting	37.00
No. 1 bundles	39.00
No. 3 bundles	35.00
No. 3 bundles	29.00
Machine shop turn.	18.00
Cast iron borings	18.00
No. 1 RR. hvy. melting	39.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	\$39.00
No. 2 hvy. melting	37.00
No. 1 bundles	39.00
No. 2 bundles	33.00
No. 3 bundles	29.00
Machine shop turn.	18.00
Shoveling turnings	21.00
Cast iron borings	18.00
Elec. furn. 1 ft and under	39.00
No. 1 RR. hvy. melting	39.00
No. 1 cupola cast.	45.00

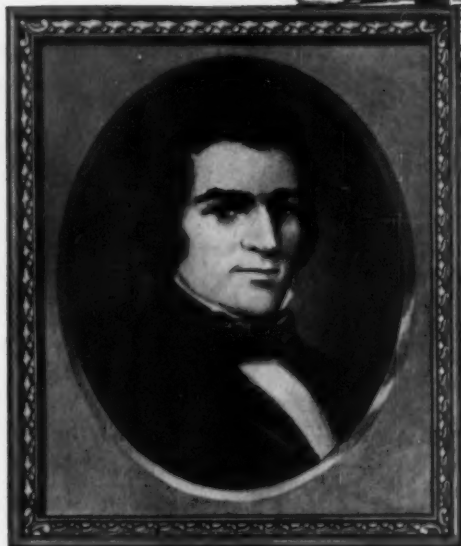
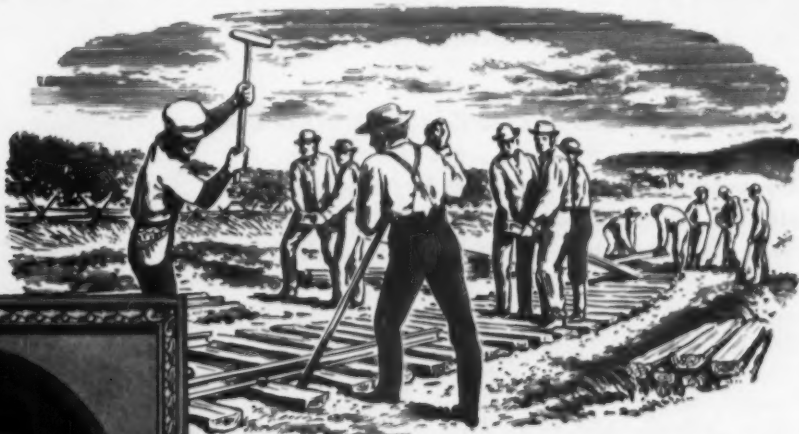
Seattle

No. 1 hvy. melting	\$42.00
No. 2 hvy. melting	38.00
No. 2 bundles	34.00
No. 3 bundles	30.00
No. 1 cupola cast.	40.00
Mixed yard cast.	40.00

Hamilton, Ont.

No. 1 hvy. melting	\$38.50
No. 2 hvy. melting	25.50
No. 1 bundles	38.50
No. 2 bundles	22.50
Mixed steel scrap	22.50
Bushelings	33.50
Bush., new fact. prep'd	26.50
Bush., new fact. unprep'd	22.50
Machine shop turn.	18.00
Short steel turn.	25.50
Mixed bor. and turn.	\$16.00 to 17.00
Rails, re-rolling	47.50
Cast scrap	42.00 to 45.00

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING



The first use of the T-Rail invented by Robert L. Stevens. This is the eleventh in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

1830 The T-Rail

It was a grateful iron and steel industry that greeted the T-Rail design of Robert L. Stevens in 1830, although it wasn't until 1845 that they were first rolled in America.

Transportation was developing at a rapid rate and rails up to that point were unsatisfactory. The roads required a rail that could meet increased loads, speeds and travel. Flat rails jarred loose. Cast iron and rolled shaped sections proved inadequate. So, too, were the

Robert L. Stevens

first rolled rails. Stevens' rail had a broad base which fastened directly onto the cross ties. It did the job and served the American rail system during its most climactic period.

With the advent of the Bessemer process and later the open-hearth process, production expanded and quality improved. But by 1883 iron had given way almost entirely to steel. From 1911 all rails have been steel. Today, the buyer of rails receives a product that has been tested and inspected more exhaustively than any other heavy product in the steel industry.

These special steels require special scrap of known analysis, a problem particularly suited to our experience, personnel, equipment, and the strategic location of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP **LURIA BROTHERS AND COMPANY, INC.**

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

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LEBANON, PENNA. DETROIT (ECORSE),
READING, PENNA. MICHIGAN
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.



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CLEVELAND, OHIO PITTSBURGH, PA. SEATTLE, WASH.
DETROIT, MICH. MONTREAL, CANADA

EXPORTS-IMPORTS **LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. Cable Address: **FORENTRACO**

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Aluminum Outlook Brighter

ODM announces no call for aluminum for stockpile in first half 1956 . . . Good possibility none will be called for entire year . . . Two new companies to enter field.

♦ **ALUMINUM CONSUMERS** got good news about future supplies of the metal for both the short and long term last week.

Immediate encouragement came from Washington, where Office of Defense Mobilization announced it will not call any aluminum for the stockpile during the first six months of 1956. This will release an additional 100 million lb of the light metal to industry.

ODM also decided to delay delivery until Apr. 30, 1956, of the 50 million lb of aluminum it had originally called for in the fourth quarter of 1955. The government didn't say so, but there is a very good chance that the government won't call for aluminum in the second six months of next year either.

Official reason for the decision not to expand the stockpile during first half is, expansions in aluminum capacity are now underway and planned, to provide a greater emergency supply. This reduces the government's need to stockpile, ODM states. In addition, 1953 and 1954 deliveries to the stockpile were at a higher rate than usual due to slower industrial demand. Stockpile in good shape and capacity approaching the government's expansion goal, is a good reason to expect suspen-

sion of stockpile deliveries throughout 1956.

Long term encouragement to aluminum users came with news that both Olin Mathieson Corp. and St. Joseph Lead Co. are taking steps to enter the aluminum business. Plans for both hinge on negotiations for the large amounts of electric power required. Talks are now going on with utilities to supply the juice generated from coal.

Olin Mathieson was originally granted a certificate of necessity for fast tax write-off in 1952. At that time the cost of the project was figured at \$123 million. Last June O-M cut its estimate to the present figure of \$79 million and received a year's extension of its certificate from ODM. Current company plans call for spending over \$74 million for facilities to produce 60,000 tons of primary aluminum. Intended facilities are an alumina plant, a reduction line and a rolling mill. Output will be used mainly to supply O-M's own sheet needs.

Three-way talks between O-M, American Gas & Electric Co. and Pittsburgh Consolidation Coal Co. are now underway to work out prices for the power needed and to determine a plant site. Area now under chief consideration is

in the tri-state group of West Virginia, eastern Kentucky and southeast Ohio. If the site picked falls within AG&E's operating area, the utility will build a power plant of 400,000 kw or more, of which over 155,000 kw would go to the aluminum plant.

St. Joseph Lead is asking Duquesne Light Co. to give it the same type of power contract O-M is asking from AG&E for an \$80 million aluminum plant, possibly at Josephtown, Pa. Pitt-Consol, who would be coal supplier in each case, would build one plant jointly with St. Joe if the power deal can be worked out.

COPPER . . . Copper demand continues strong. There is general agreement that most of the buying is for actual needs, although some demand is a reflection of LIFO inventory problems. Some users are replenishing low cost inventories at present higher price levels to avoid a large tax bite. Copper users must at least take title to the higher price metal before Jan. 1 to achieve the desired tax savings.

However, reports of at least a scattering of orders for first quarter delivery point up the reasons for believing that most of the still strong copper demand stems from actual production requirements.

Apparently as a result of increases in copper scrap prices, leading custom smelters raised their selling price ½¢ per lb on electrolytic copper to 45.50¢ per lb delivered for prompt and December shipment. Fair quantities have already been sold at the advanced price level.

The first indication that Chile's strangle hold on Anaconda and Kennecott subsidiaries mining in that country might be slipping came with the report that Chile would exchange dollars for pesos needed for operating costs at the rate of 300 per dollar. The rate according to the previous agreement was 200 pesos per dollar.

Chile will still profit on the deal since the open market rate of exchange is fluctuating between 600 and 750 pesos per dollar. However it will mean that American subsidiaries will get 50 pct more for their dollars, a concession that Chile would not grant if she didn't have to. This very well may be in line with the IRON AGE report (Nov. 3, page 60) that price control could shift under Anaconda's terms for new copper facilities investment.

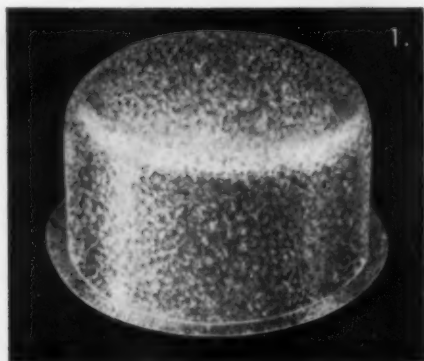
Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Nov. 9	Nov. 10	Nov. 11	Nov. 12	Nov. 14	Nov. 15
Copper, electro, Conn.	43.00	43.00	43.00	43.00	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	43.00	43.00	43.00
Tin, Straits, New York	96.25	96.375	96.375	....	96.875	96.875*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	15.30	15.30	15.30	15.30	15.30	15.30

Note: Quotations are going prices

*Tentative



A CHALLENGE:

THE STRONGEST MADE BY
ANY GALVANIZED SHEET—

.....

*Anything that can be
made of steel sheets
can be made of*

WHEELING

SOFTITE

galvanized sheets!

Looking at the smooth, unbroken finish on these gasoline can components, you'd hardly believe they are made of a galvanized sheet. Yet, they are!

They are all made of Wheeling SOFTITE, the ductile galvanized sheet with the tightest zinc coating yet produced . . . so tight, in fact, that you can use Wheeling SOFTITE to make anything you can make of steel sheets.

That's SOFTITE . . . Wheeling SOFTITE . . . made by the company that led with the development of COP-R-LOY, the original copper-bearing steel pipe and perfected DUCTILLITE, the original cold reduced tin plate which revolutionized the tin plate industry and opened new fields to the can maker and packer. Because of the unprecedented demand for SOFTITE Galvanized Sheets, Wheeling has been forced to triple its production facilities in 1955.

IT'S WHEELING STEEL



DISTRICT SALES OFFICES—Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling

FIRST CAME **COP-R-LOY**. THEN *Ductillite*. NOW WHEELING **SOFTITE**

November 17, 1955

175

Nonferrous Prices (Effective Nov. 15, 1955)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum
(Base 20,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
(“T” temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-
1100, 3003....	40.8	38.7	37.5	36.5
6062.....	48.3	43.4	41.7	39.9
6061-0.....	45.4	41.3	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8.....	41.6-43.3	56.6-60.2
12-14.....	42.3-43.7	57.5-61.8
24-26.....	45.3-45.7	67.7-72.1
36-38.....	53.6-54.2	90.5-94.3

Screw Machine Stock—2011-T-3

Size*	3/4	5/8-3/4	1/2-1	1 1/4-1 1/2
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 20" wide, base, 16,000 lb)

Length* →	72	96	120	144
.919 gage.....	\$1.295	\$1.727	\$2.160	\$2.590
.854 gage.....	1.615	2.162	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FE1-O 1/4 in., 61¢; 5/16 in., 62¢; 1/2 in., 61¢; 3/4 in., 78¢; 1 in., 99¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FE, diam 1/4 to 3/16 in., 52.5¢; 1/2 to 3/4 in., 66¢; 1 1/4 to 1 7/8 in., 69.5¢; 2 1/2 to 3 in., 87¢. Other alloys higher. Base up to 1/4 diam, 10,000 lb; 1/2 to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: FE, in weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 2.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 68¢; 1.6 to 2.59 lb, 19.5 in., 60.8¢; 4 to 6 lb, 28 in., 67.7¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/4 to 1.50 lb, 20,000 lb; 1.50 lb and heavier, 30,000 lb.

Extruded Round Tubing: FE, 0.040 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., 81.63¢; 5/16 to 3/4 in., 81.47¢; 3/4 to 1 in., 81.10¢; 1 to 3 in., 92.5¢; 0.168 to 0.219 in. wall: OD, 5/8 to 1 in., 76.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.6¢. Other alloys higher. Base OD: Up to 1 1/4 in., 10,000 lb; 1 1/4 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper.....	56.79	56.11	55.86
Copper, h-r.....	56.76	56.11	56.36
Copper, drawn.....	53.15	52.09	52.09
Low brass.....	49.27	49.21	49.21
Yellow brass.....	54.54	54.48	54.48
Naval brass.....	52.83	47.14	49.40
Leaded brass.....	56.48	56.43	56.43
Com. bronze.....	56.57	56.67	56.67
Mang. bronze.....	77.14	77.64	77.64
Phos. bronze.....	50.34	46.75	48.00
Muntz metal.....	53.05	56.13	56.50
Ni silver, 10 pot.....	53.05	56.13	56.50
Beryllium copper, CR, 1.9% Be, Base			
2000 lb, f.o.b.			
Strip.....	\$1.34		
Rod, bar, wire.....	1.81		

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR.....	102	83	99
Strip, CR.....	102	93	125
Rod, Bar, HR.....	87	74	93
Angles, HR.....	87	74	93
Plate, HR.....	97	87	95
Seamless Tube.....	122	110	163
Shot, Blocks.....	71	...	...

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$14.00-\$14.50; alloy \$16.50; Plate, HR, commercially pure, \$11.50-\$12.90; alloy, \$12.50-\$12.75; Wire, rolled and/or drawn, commercially pure, \$10.50-\$11.00; alloy, \$12.50; Bar, HR or forged, commercially pure, \$8.50-\$8.75; alloy, \$8.50-\$9.00.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed..... 24.40
Aluminum pig..... 22.50
Antimony, American, Laredo, Tex..... 33.50
Beryllium copper, per lb cont'd Be..... \$42.00
Beryllium aluminum 5% Be, Dollars per lb contained Be..... \$72.75
Bismuth, ton lots..... 32.25
Cadmium, del'd..... 31.70
Cobalt, 97-99% (per lb)..... \$2.60 to \$2.67
Copper, electro, Conn. Valley..... 45.00
Copper, Lake, delivered..... 42.00
Gold, U. S. Treas., per troy oz..... \$35.00
Indium, 99.9%, dollars per troy oz..... \$2.25
Iridium, dollars per troy oz..... \$100 to \$120
Lead, St. Louis..... 15.30
Lead, New York..... 16.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig..... 32.50
Ingot..... 32.25
Magnesium, sticks, 100 to 500 lb..... 53.00
Mercury, dollars per 76-lb flask, f.o.b. New York..... \$280 to \$285
Nickel electro..... 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel..... 60.75
Palladium, dollars per troy oz..... \$22.20 to \$24
Platinum, dollars per troy oz..... \$97 to \$99
Silver, New York, cents per troy oz..... 91.825
Tin, New York..... 96.875¢
Titanium, sponge, grade A-1..... 33.75
Zinc, East St. Louis..... 13.00
Zinc, New York..... 13.50
Zirconium, sponge..... \$10.00
* Tentative

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115.....	41.00
No. 120.....	40.50
No. 122.....	40.00
80-10-10 ingot	
No. 305.....	44.75
No. 315.....	43.00
85-10-5 ingot	
No. 210.....	56.25
No. 215.....	52.75
No. 245.....	47.25
Yellow ingot	
No. 405.....	33.75
Manganese bronze	
No. 421.....	36.25

Aluminum Ingot

(Cents per lb del'd 20,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.....	32.00-32.00
0.60 copper max.....	31.75-32.75
Piston alloys (No. 122 type).....	32.75-32.75
No. 12 alum. (No. 2 grade).....	30.00-30.75
108 alloy.....	30.00-30.50
195 alloy.....	31.50-32.75
13 alloy (0.60 copper max).....	31.75-32.75
AXB-679.....	30.00-30.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97 1/4%.....	31.00-32.00
Grade 2—92-95%.....	30.00-31.00
Grade 3—90-92%.....	29.00-30.00
Grade 4—85-90%.....	28.00-28.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	39	38 1/2
Yellow brass.....	28 1/2	26 1/2
Red brass.....	34 1/2	33 1/2
Comm. bronze.....	26 1/2	25
Mang. bronze.....	26 1/2	25 1/2
Yellow brass rod ends.....	28 1/2	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	40
No. 2 copper wire.....	28 1/2
Light copper.....	26 1/2
*Refinery brass.....	36
*Dry copper content.....	

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	39 1/2
No. 2 copper wire.....	28
Light copper.....	26 1/2
No. 1 composition.....	33 1/2
No. 1 comp. turnings.....	32 1/2
Rollled brass.....	29 1/2
Brass pipe.....	25
Radiators.....	25 1/2

	Aluminum
Mixed old cast.....	20 — 21
Mixed new clips.....	21 — 22
Mixed turnings, dry.....	20 — 21 1/2

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire.....	36 1/2 — 37
No. 2 heavy copper and wire.....	35 — 36
Light copper.....	33 — 33 1/2
New type shell cuttings.....	32 — 32 1/2
Auto radiators (unsweated).....	22 — 22 1/2
No. 1 composition.....	29 — 29 1/2
No. 1 composition turnings.....	27 — 27 1/2
Unlined red car boxes.....	24 — 24 1/2
Cocks and faucets.....	23 1/2 — 24
Mixed heavy yellow brass.....	18 1/2 — 19
Old rolled brass.....	22 — 22 1/2
Brass pipe.....	24 1/2 — 25
New soft brass clippings.....	24 — 24 1/2
No. 1 brass rod turnings.....	22 — 22 1/2

Aluminum

Alum. pistons and struts.....	16 1/2 — 17
Aluminum crankcases.....	16 1/2 — 17 1/2
1100 (2S) aluminum clippings.....	16 1/2 — 17 1/2
Old sheet and utensils.....	16 1/2 — 17 1/2
Borings and turnings.....	11 — 11 1/2
Misc. cast aluminum.....	16 1/2 — 17 1/2
2024 (24s) clippings.....	18 — 18 1/2

Zinc

New zinc clippings.....	8 — 8 1/2
Old zinc.....	5 1/2 — 6
Zinc routings.....	4
Old die cast scrap.....	3 1/2

Nickel and Monel

Pure nickel clippings.....	125
Clean nickel turnings.....	100
Nickel anodes.....	125
Nickel rod ends.....	125
New Monel clippings.....	54 1/2
Clean Monel turnings.....	44
Old sheet Monel.....	50
Nickel silver clippings, mixed.....	23
Nickel silver turnings, mixed.....	19

Lead

Soft scrap lead.....	12 — 12 1/2
Battery plates (dry).....	6 1/2 — 6 3/4
Batteries, acid free.....	4 1/2

Magnesium

Segregated solids.....	18 1/2 — 19
Castings.....	17 1/2 — 18

Miscellaneous

Block tin.....	80 — 81
No. 1 pewter.....	63 — 64
Auto babbitt.....	42 — 43
Mixed common babbitt.....	14 1/2
Solder joints.....	19 1/2 — 20
Siphon tops.....	43
Small foundry type.....	16 1/2
Monotype.....	18
Lino. and stereotype.....	14 — 14 1/2
Electrotype.....	12 — 12 1/2
Hand picked type shells.....	10 1/2 — 11
Lino. and stereo. dross.....	6
Electro dross.....	5

IRON AGE

STEEL
PRICES(Effective
Nov. 15, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffalo, N. Y.	\$68.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3,B3 6.25 R3, S10	6.425 B3	9.10 B3		
	Claymont, Del.												
	Harrison, N. J.												13.45 C11
	Conschohocken, Pa.							4.375 A2	6.30 A2	6.425 A2			
	New Bedford, Mass.								6.70 R6				
	Johnstown, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3						
	Boston, Mass.								6.80 T8				13.80 T8
	New Haven, Conn.								6.70 D1 7.00 A5				
	Phoenixville, Pa.				5.15 P2		5.15 P2						
	Sparrows Pt., Md.							4.325 B3	6.25 B3	6.425 B3	9.10 B3		
MIDDLE WEST	Bridgeport, Wallingford, Conn.	\$71.50 N8	\$89.50 N8					4.625 N8	6.70 W1			7.50 N8	
	Pawtucket, R. I. Worcester, Mass.								90 N7 ..0 A5				A5 13.80 N7
	Alton, Ill.							4.50 L1					
	Ashland, Ky.							4.325 A7					
	Canton-Massillon, Dover, Ohio		\$86.50 R3	\$96.00 R3									13.45 G4
	Chicago, Ill.	\$68.50 U1	\$84.50 R3, U1,W8	\$96.00 R3, U1,W8	5.45 U1	4.60 U1, W8	6.75 U1, Y1	4.60 U1	4.325 A1, N4,W8	6.35 A1,T8		7.20 W8	13.45 T8
	Cleveland, Ohio								6.25 A5,J3		9.30 A5		13.45 A5
	Detroit, Mich.			\$96.00 R5				4.425 G3,M2	6.35 D1,D2, G3,M2,P11	6.525 G3	9.30 D2, G3		
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$68.50 U1	\$84.50 U1	\$96.00 U1, Y1	5.45 J3	4.60 U1, J3	6.75 U1, J3	4.325 J3, U1,Y1	6.35 J3 6.25 Y1	6.425 J3, U1,Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.							4.425 N4					
WEST	Indianapolis, Ind.								6.40 C5				
	Newport, Ky.											7.20 N5	
	Middletown, Ohio								6.45 A7				
	Niles, Warren, Ohio Sharon, Pa.	\$68.50 C10	\$84.50 C10	\$96.00 C10				4.325 S1, R3	6.25 S1, R3,T4	6.425 S1, R3	9.10 S1, R3	7.20 S1	13.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 U1, J3	\$84.50 J3, U1,C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.325 P6	6.25 S7,B4			7.20 S9	13.45 S9
	Portsmouth, Ohio							4.325 P7	6.25 P7				
	Weirton, Wheeling, Follansbee, W. Va.					4.60 W3		4.325 W3	6.25 F3,W3	6.425 W3	9.10 W3		
	Youngstown, Ohio		\$84.50 C10	\$96.00 Y1, C10		4.60 Y1	6.75 Y1	4.325 U1, Y1	6.25 Y1,C5	6.425 U1, Y1	9.30 Y1	7.20 U1, Y1	13.45 C5 " 8
	Fontana, Cal.	\$76.00 K1	\$92.00 K1	\$115.00 K1		5.25 K1	7.40 K1	5.40 K1	5.075 K1	8.00 K1	7.525 K1	8.85 K1	
	Geneva, Utah		\$84.50 C7			4.60 C7	6.75 C7						
	Kansas City, Mo.					4.70 S2	6.85 S2					7.45 S2	
SOUTH	Los Angeles, Torrance, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2		5.075 C7, B1	8.30 C1		8.40 B2	
	Minnequa, Colo.					4.90 C6			5.425 C6				
	Portland, Ore.					5.35 O2							
	San Francisco, Niles, Pittsburg, Cal.		\$94.00 B2			5.25 B2, P9	7.40 B2		5.075 B2, C7				
	Seattle, Wash.		\$98.00 B2			5.35 B2	7.50 B2		5.325 B2				
	Atlanta, Ga.								4.525 A8				
	Fairfield, Ala. City, Birmingham, Ala.	\$88.50 T2	\$84.50 T2			4.60 C16, R3,T2	6.75 T2		4.325 R3, C16,T2		6.425 T2		
	Houston, Lone Star, Tex.	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2			6.675 S2		7.45 S2	

IRON AGE		States identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Nov. 15, 1955)		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE	
		Hot-rolled 16 ga. & heavier	Cold-rolled	Galvanized 16 ga.	Enamel-ling 12 ga.	Long Terns 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			W6	† Special coated mfg. tarne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 125 lb. deduct \$2.20 from 1.25-lb. coke base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conschocken, Pa.	4.375 A2	5.375 A2				6.425 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.									5.025 B3				
	Fairless, Pa.	4.375 U1	5.375 U1				6.425 U1	7.925 U1				\$9.30 U1	\$8.00 U1	
	New Haven, Conn.													
Phoenixville, Pa.														
Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.60 B3		5.125 B3	\$9.30 B3	\$8.00 B3		
Worcester, Mass.										5.325 A5				
Tranton, N. J.														
MIDDLE WEST	Altam, Ill.									5.20 L1				
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7									
	Canton-Massillon, Devar, Ohio			5.85 R1, R3										
	Chicago, Joliet, Ill.	4.325 A1, W8					6.375 U1			5.025 A5, N4, R3				
	Sterling, Ill.									5.125 N4				
	Cleveland, Ohio	4.325 J3, R3	5.325 J3, R3		5.90 R3		6.375 J3, R3	7.875 J3, R3			5.025 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3, 5.325 M2				6.475 G3	7.975 G3						
	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5										
	Gary, Ind. Harbor, Indiana	4.325 J3, U1, Y1	5.325 J3, U1, Y1	5.85 U1, J3	5.90 U1, J3	6.25 U1	6.375 Y1, U1, J3	7.875 U1, Y1			5.025 Y1	\$9.20 J3, U1, Y1	\$7.90 J3, U1, Y1	6.65 U1, Y1
	Granite City, Ill.	4.525 G2	5.525 G2	6.05 G2	6.10 G2								\$8.00 G2	6.75 G2
Kokomo, Ind.	4.425 C9		5.95 C9						5.475 C9	5.125 C9				
Mansfield, Ohio	4.325 E2	5.325 E2			6.25 E2				E2					
Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7									
Niles, Warren, Ohio Sharon, Pa.	4.325 S1, R3, N3	5.325 R3, N3	5.85 R3, 6.85 N3	5.90 N3	6.25 N3	6.375 S1, R3	7.875 R3				\$9.20 R3	\$7.90 R3		
Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 J3, U1, P6	5.325 J3, U1, P6	5.85 U1	5.90 U1, A7		6.375 J3, U1	7.875 U1	8.60 U1		5.025 A5, P6	\$9.20 J3, U1	\$7.90 J3, U1	6.65 U1	
Portsmouth, Ohio	4.325 P7	5.325 P7								5.025 P7				
Worlton, Wheeling, Follansbee, W. Va.	4.325 W3, W5	5.325 W3, W5, F3	5.85 W3, W5		6.25 W3, W5	6.375 W3	7.875 W3				\$9.20 W3, W5	\$7.90 W3, W5	6.65 F3, W5	
Youngstown, Ohio	4.325 U1, Y1	5.325 Y1		5.90 Y1		6.375 U1, Y1	7.875 Y1			5.025 Y1				
WEST	Fontana, Cal.	5.075 K1	6.425 K1				7.125 K1	8.975 K1						
	Genova, Utah	4.425 C7												
	Kansas City, Mo.									5.275 S2				
	Los Angeles, Torrance, Cal.									5.625 B2				
	Minneapolis, Colo.									5.275 C6				
	San Francisco, Niles, Pittsburg, Cal.	5.025 C7	6.275 C7	6.60 C7						5.675 C7	\$9.95 C7	\$8.65 C7		
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 R3, T2	5.325 T2	5.85 R3, T2			6.375 T2			5.025 R3	5.025 R3, T2	\$9.30 T2	\$8.00 T2	
	Houston, Tex.										5.275 S2			

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES		BARS					PLATES				WIRE	
(Effective Nov. 15, 1955)		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	Mir'a. Bright
EAST	Bethlehem, Pa.				5.575 B3	7.425 B3	6.80 B3					
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	5.95 B5	5.575 B3,R3	7.425 B3,B5	6.80 B3	4.90 B3,R3				6.25 W6
	Claymont, Del.							4.90 C4		6.30 C4	6.725 C4	
	Coatesville, Pa.							4.90 L4		6.30 L4	6.725 L4	
	Conshehocken, Pa.							4.90 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 C3	5.575 C3			
	Hartford, Conn.			6.40 R3		7.725 R3						
	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.90 B3		6.30 B3	6.725 B3	6.25 B3
	Fairless, Pa.	4.90 U1	4.90 U1		5.725 U1							
	Newark, N. J.			6.35 W10		7.60 W10						
	Camden, N. J.			6.35 P10								
	Bridgeport, Putnam, Conn.	4.90 N8		6.45 W10	5.725 N8			4.750 N8				
	Sparrows Pt., Md.		4.65 B3					4.90 B3		6.30 B3	6.725 B3	6.35 B3
MIDDLE WEST	Palmer, Worcester, Needville, Mass.			6.35 W11 6.45 B5,C14		7.725 A5,B5		4.90 R3				6.55 A5, W6
	Spring City, Pa.			6.35 K4		7.60 K4						
	Alton, Ill.	4.85 L1										6.425 L1
	Ashland, Newport, Ky.							4.90 A7,N5		6.30 N5		
	Canton-Massillon, Mansfield, Ohio	4.75 R3		5.90 R2,R3	5.575 R3,T5	7.425 R2,R3, T5		4.90 E2				
	Chicago, Joliet, Ill.	4.65 U1, N4,W8,R3, P13	4.65 N4,R3, P13	5.90 A5,W10, W8,B5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.90 U1,W8, L3,A1,R3	5.575 U1	6.30 U1	6.725 U1	6.25 A5,R3, N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	5.90 A5,C13		7.425 A5,C13	6.80 R3	4.90 J3,R3	5.575 J3		6.725 R3,J3	6.25 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.10 B5,P8 6.15 P3	5.575 R5 5.675 G3	7.425 R5 7.625 B5,P3 P8	6.90 G3	4.60 G3			6.825 G3	
	Duluth, Minn.											6.25 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 I3,U1, Y1	4.65 I3,U1, Y1	5.90 M5,R3	5.575 I3,U1, Y1	7.425 M5, R3	6.80 U1,I3, Y1	4.90 J3, U1,Y1	5.575 J3	6.30 U1,Y1	6.725 U1, I3,Y1	6.35 M4
	Granite City, Ill.							4.70 G2				
	Kokomo, Ind.											6.35 C9
	Sterling, Ill.	4.75 N4	4.75 N4									6.35 N4
WEST	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		5.90 C10	5.575 C10	7.425 C10	6.80 R3	4.90 S1,R3		6.30 S1	6.725 S1	
	Pittsburgh, Pa. Midland, Pa.	4.65 J3,U1, C11	4.65 J3,U1	5.90 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.80 J3,U1	4.90 J3,U1	5.575 U1	6.30 U1	6.725 J3,U1	6.25 A5,J3, P6
	Portsmouth, Ohio											6.25 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.65 W3						4.90 W3,W5				
	Youngstown, Ohio	4.65 U1,Y1, C10,R3	4.65 U1,Y1, R3	5.90 Y1,U1	5.575 U1,Y1, C10	7.425 Y1,C10 7.665 F2	6.80 U1,Y1	4.90 U1,Y1, R3		6.30 Y1	6.725 Y1	6.25 Y1
	Emeryville, Cal.	5.40 J5	5.40 J5									
	Fontana, Cal.	5.35 K1	5.35 K1		6.625 K1		7.50 K1	6.15 K1		6.95 K1	7.375 K1	
	Geneva, Utah							4.90 C7			6.725 C7	
	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.05 S2					6.50 S2
	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.35 R3	6.825 B2		7.50 B2				7.825 B2	7.20 B2
	Minneapolis, Colo.	5.10 C6	5.10 C6					5.35 C6				6.50 C6
	Portland, Ore.	5.40 O2	5.40 O2									
	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2					7.20 C7
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.20 B2	7.825 B2	
SOUTH	Atlanta, Ga.	4.85 A8	4.85 A8									6.45 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,C16, R3	4.65 T2,C16, R3				6.80 T2	4.90 T2,R3			6.725 T2	6.25 R3, T2
	Houston, Ft. Worth, Lone Star, Tex.	4.90 S2	4.90 S2		5.825 S2		7.60 S2	4.85 L3 4.90 S2		6.40 S2	6.825 S2	6.50 S2

Steel Prices (Effective Nov. 15, 1955)

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
- A2 Alan Wood Steel Co., Conshohocken, Pa.
- A3 Allegheny Ludlum Steel Corp., Pittsburgh
- A4 American Cladmetals Co., Carnegie, Pa.
- A5 American Steel & Wire Div., Cleveland
- A6 Angell Nail & Chaplet Co., Cleveland
- A7 Armco Steel Corp., Middletown, O.
- A8 Atlantic Steel Co., Atlanta, Ga.
- B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- B2 Bethlehem Pacific Coast Steel Corp., San Francisco
- B3 Bethlehem Steel Co., Bethlehem, Pa.
- B4 Blair Strip Steel Co., New Castle, Pa.
- B5 Bliss & Laughlin, Inc., Harvey, Ill.
- B6 Brook Plant, Wirewire Spencer Steel Div., Birdsboro, Pa.
- C1 Calstrip Steel Corp., Los Angeles
- C2 Carpenter Steel Co., Reading, Pa.
- C3 Central Iron & Steel Co., Harrisburg, Pa.
- C4 Claymont Products Dept., Claymont, Del.
- C5 Cold Metal Products Co., Youngstown, O.
- C6 Colorado Fuel & Iron Corp., Denver
- C7 Columbia Geneva Steel Div., San Francisco
- C8 Columbia Steel & Shifting Co., Pittsburgh
- C9 Continental Steel Corp., Kokomo, Ind.
- C10 Copperweld Steel Co., Pittsburgh, Pa.
- C11 Crucible Steel Co. of America, Pittsburgh
- C12 Cumberland Steel Co., Cumberland, Md.
- C13 Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shifting Co., Roadville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C17 Chester Blast Furnace Inc., Chester, Pa.
- D1 Detroit Steel Corp., Detroit
- D2 Detroit Tube & Steel Div., Detroit
- D3 Driver Harris Co., Harrison, N. J.
- D4 Dickson Weatherproof Nail Co., Evanston, Ill.
- D5 Henry Dismont & Sons, Inc., Philadelphia
- E1 Eastern Stainless Steel Corp., Baltimore
- E2 Empire Steel Co., Mansfield, O.
- F1 Fifth Starling, Inc., McKeesport, Pa.
- F2 Fitzsimmons Steel Corp., Youngstown
- F3 Follansbee Steel Corp., Follansbee, W. Va.
- G1 Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.
- G3 Great Lakes Steel Corp., Detroit
- G4 Greer Steel Co., Dover, O.
- H1 Hanna Furnace Corp., Detroit
- I1 Ingersoll Steel Div., Chicago
- I2 Inland Steel Co., Chicago
- I4 Interlake Iron Corp., Cleveland
- J1 Jackson Iron & Steel Co., Jackson, O.
- J2 Jessop Steel Corp., Washington, Pa.
- J3 Jones & Laughlin Steel Corp., Pittsburgh
- J4 Joslyn Mfg. & Supply Co., Chicago
- J5 Judson Steel Corp., Emeryville, Calif.
- K1 Kaiser Steel Corp., Fontana, Cal.
- K2 Keystone Steel & Wire Co., Peoria
- K3 Koppers Co., Granite City, Ill.
- K4 Keystone Drawn Steel Co., Spring City, Pa.
- L1 Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- L3 Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.
- M1 Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
- M5 Monarch Steel Div., Hammond, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- N1 National Supply Co., Pittsburgh
- N2 National Tube Div., Pittsburgh
- N3 Niles Rolling Mill Div., Niles, O.
- N4 Northwestern Steel & Wire Co., Sterling, Ill.
- N5 Newport Steel Corp., Newport, Ky.
- N6 Northwest Steel Rolling Mills, Seattle
- N7 Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Northeastern Steel Corp., Bridgeport, Conn.
- O1 Oliver Iron & Steel Co., Pittsburgh
- O2 Oregon Steel Mills, Portland
- P1 Page Steel & Wire Div., Monroeville, Pa.
- P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P4 Pittsburgh Coke & Chemical Co., Pittsburgh
- P5 Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh
- P7 Portamin Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit
- P12 Pacific Steel Rolling Mills, Seattle
- P13 Phoenix Mfg. Co., Joliet, Ill.
- R1 Reeves Steel & Mfg. Co., Dover, O.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Rodding Sons Co., John A. Trenton, N. J.
- R5 Rotary Electric Steel Co., Detroit
- R6 Rodney Metals, Inc., New Bedford, Mass.
- R7 Ronco Strip Steel Co., Rome, N. Y.
- S1 Sharon Steel Corp., Sharon, Pa.
- S2 Sheffield Steel Corp., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw & Steel Co., Fitchburg, Mass.
- S5 Sweet's Steel Co., Williamsport, Pa.
- S6 Standard Forging Corp., Chicago
- S7 Stanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Corp., Carnegie, Pa.
- S10 Seneca Steel Service, Buffalo
- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
- T2 Tennessee Coal & Iron Div., Fairfield
- T3 Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
- T5 Timken Steel & Tube Div., Canton, O.
- T6 Tremont Nail Co., Waltham, Mass.
- T7 Texas Steel Co., Fort Worth
- T8 Thompson Wire Co., Boston
- U1 United States Steel Corp., Pittsburgh
- U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- W1 Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago, Ill.
- W8 Wisconsin Steel Co., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wycoff Steel Co., Pittsburgh
- W11 Worcester Pressed Steel Co., Worcester, Mass.
- W12 Wallace Barnes Steel Div., Bristol, Conn.
- Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) l.b. m. Base price about \$280 per net ton.

	BUTTWELD												SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2 in.		3 in.		3 1/2 in.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. B3	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75						
Youngstown R3	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75						
Fontana K1	6.00	+0.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	0.50	16.50	0.25						
Pittsburgh J3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Alton, Ill. L1	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75						
Sharon M3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75						
Fairless N2	15.00	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75						
Pittsburgh N1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Wheeling W5	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75						
Wheatland W4	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75						
Youngstown Y1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Indiana Harbor Y1	16.50	1.25	19.50	5.25	22.00	6.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75						
Lorain N2	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3	20.0	6.25	24.00	10.25	28.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75						
Youngstown R3	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75						
Fairless N2	20.0	6.25	24.00	10.25	28.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75						
Fontana K1	10.50		14.50		16.50		17.00		17.50		18.00		18.50							
Pittsburgh J3	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	8.00	+6.00	13.00	+8.75	15.50	+6.25
Alton, Ill. L1	20.0	6.25	24.00	10.25	28.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75						
Sharon M3	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75						
Pittsburgh N1	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	8.00	+6.00	13.00	+8.75	15.50	+6.25
Wheeling W5	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75						
Wheatland W4	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75						
Youngstown Y1	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	8.00	+6.00	13.00	+8.75	15.50	+6.25
Indiana Harbor Y1	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75						
Lorain N2	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	8.00	+6.00	13.00	+8.75	15.50	+6.25

Threads only, butt weld and seamless 3 1/2 pt higher discount. Plain ends, butt weld and seamless, 3-in. and under, 4 1/2 pt higher discount. Butt weld jokers discount, 5 pt. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 1 3/4 and 2 in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price new 13.00¢ per lb.

Steel Prices (Effective Nov. 15, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1	4.725	5.65	5.825				
So. Chicago R3				7.90			
Esley T2	4.725	5.65					
Fairfield T2		5.65		7.90	5.625		
Gary U1	4.725	5.65			5.625		
Ind. Harbor J3	4.725	5.625	7.90		5.625		
Johnstown B3		5.65	5.825				
Juliet U1		5.65	5.825				
Kansas City S2				7.90			
Lackawanna B4	4.725	5.65	5.825		5.625		
Minneapolis C5	4.725	6.15	5.825	7.90	5.625	12.40	
Pittsburgh O1					11.90	12.40	
Pittsburgh P5						12.40	
Pittsburgh J3				7.90			
Seattle B2				8.40	5.775	12.90	
St. Louis B3	4.725	5.625			5.625		
Struthers Y1				7.90			
Terrace C7					5.775		
Williamsport S3		5.65					
Youngstown R3				7.90			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb.	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field	8.48	8.60	
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Motor	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.65	Trans. 60	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beach Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).
* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Wire Wire		Fence 8-15 1/2 ga.		Fence Posts		Single Loop Bolo Ties		Gals. Backed and Twisted Barbed Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City R3	152	162			173	175	7.40	7.90								
Alhquippa, Pa. J3	152	162					7.40	7.90								
Atlanta A8	154	167			175	180	7.50	8.025								
Bartonsville K2	154	168			175	181	7.50	8.075								
Buffalo W6							7.40	7.90								
Chicago, Ill. N4	152	166			173	179	7.40	8.00								
Cleveland A6	157						7.40									
Cleveland A5							7.40									
Crawfordsville M4	154	167			175	175	7.50	8.05								
Danora, Pa. A5	152	162			173	175	7.40	7.90								
Duluth A5	152	162			173	175	7.40	7.90								
Fairfield, Ala. T2	152	162			173	175	7.40	7.90								
Galveston D4	157															
Houston S2	167	170			180	7.65	8.05									
Johnstown, Pa. B3	152	166			175	7.40	7.90									
Juliet, Ill. A5	152	162			173	175	7.40	7.90								
Kokomo, Ind. C9	154	154			175	177	7.50	7.90								
Los Angeles B2							8.35	8.925								
Kansas City S2	167	174			180	7.45	8.00									
Minneapolis C5	157	167	162	178	180	7.65	8.05									
Monessen P6	152	162					7.40	7.90								
Moline, Ill. R3		162	162													
Pittsburg, Cal. C7	171	185			195	8.35	8.75									
Portsmouth P7						7.40										
Rankin, Pa. A5	152	162			175	7.40	7.90									
So. Chicago R3	152	162	157	173	175	7.40	7.90									
S. San Francisco C8					197	195	8.35	8.75								
Sparrows Pt. B3	154				175	181	7.50	8.075								
Struthers, O. Y1							7.40	7.90								
Worcester A5	158						7.70									
Williamsport, Pa. S3		160														

Galvanized products computed with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb; ** 13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.25-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bristol, Conn. W12			10.50	12.95	15.40
Buffalo, N. Y. R7	7.00	8.95	10.50	12.95	15.40
Carnegie, Pa. S9	7.00	8.95	10.50	12.95	15.40
Cleveland A5	7.00	8.95	10.50	12.95	15.40
Detroit D1	7.10	9.05	10.60	12.75	
Detroit D2	7.10	9.05	10.60		
Harrison, N. J. C11			10.80	12.95	15.40
Indianapolis C5	7.15	9.10	10.50	12.95	15.40
New Castle, Pa. B4	7.00	8.95	10.50	12.95	
New Haven, Conn. D1	7.45	9.25	10.80	12.95	
Pawtucket, R. I. N7	7.55	9.25	10.80	12.95	15.40
Pittsburgh S7	7.00	8.95	10.50	12.95	15.40
Riverdale, Ill. A1	7.10	8.95	10.50	12.95	15.40
Sharon, Pa. S1	7.00	8.95	10.50	12.95	15.40
Trenton R4					
Wallingford W1	7.45	9.25	10.80	12.95	15.40
Warren, Ohio T4	7.00	8.95	10.50	12.95	15.40
Weirton, W. Va. W3	7.10	8.95	10.50		
Worcester, Mass. A3	7.85	9.25	10.80	12.95	15.40
Youngstown C5	7.00	8.95	10.50	12.95	15.40

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	38.87	36.51	29.93	
	2 1/2	12	41.57	39.16	31.58	
	3	12	47.99	46.76	34.55	
	3 1/2	11	56.03	54.27	34.34	
	4	10	74.41	68.00	32.17	
National Tube	2	13	38.87	36.51	29.93	
	2 1/2	12	42.57	40.16	31.58	
	3	12	47.99	46.76	34.55	
	3 1/2	11	56.03	54.27	34.34	
	4	10	74.41	68.00	32.17	
Pittsburgh Steel	2	13	38.87	36.51		
	2 1/2	12	41.57	39.16		
	3	12	47.99	46.76		
	3 1/2	11	56.03	54.27		
	4	10	74.41	68.00		

WAREHOUSES

Cities	City Delivery Charge	Base price, f.o.b., dollars per 100 lb.													
		Sheets		Strip		Plates		Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled 4815	Hot-Rolled 4140	Cold-Drawn 4815	Cold-Drawn 4140	As rolled	As rolled
Baltimore	1.10	7.03	8.32	8.37	7.65		7.21	7.93	7.81	8.62	14.38	13.44	13.96	16.29	16.49
Birmingham	.15	6.80	7.93	8.05	7.06		6.99	7.28	7.08	9.35					
Boston	.10	7.70	8.81	10.27	7.94	10.30	7.80	8.13	7.83	9.53	12.15	13.40	14.45	16.85	16.50
Butte	.30	6.80	7.90	8.70	7.15		7.15	7.40	7.10	7.90					
Chicago	.25	6.80	8.09	8.50	7.04		6.99	7.28	7.00	7.75	13.20	12.85	16.95	15.90	
Cincinnati	.25	6.92	8.33	8.90	7.30		7.25	7.75	7.32	8.05	13.44	13.00	16.29	16.14	
Cleveland	.30	6.80	8.09	8.85	7.16		7.16	7.61	7.14	7.85		12.91		15.96	
Denver		8.60	10.76	11.22	8.90		8.60	8.75	8.90	9.82				17.97	
Detroit	.25	6.99	8.28	8.78	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10	
Houston		7.85	8.75	10.24	8.15		7.80	8.20	8.25	9.85	14.35	14.00	17.15	17.05	
Kansas City	.20	7.47	8.76	9.17	7.73		7.66	7.95	7.75	8.52	13.67	13.52	16.72	16.57	
Los Angeles	.10	8.05	10.00	11.00	8.35		8.05	8.30	8.05	11.25		14.25		17.85	
Memphis	.10	7.12	8.25		7.38		7.31	7.60	7.40	9.15					
Milwaukee	.25	6.89	8.18	8.59	7.15		7.08	7.45	7.17	7.94		12.94		15.99	
New Orleans	.15	7.20	8.35		7.45		7.40	7.70	7.50	9.55					
New York	.10	7.46	9.23	9.44	8.07	11.10	7.76	7.99	7.96	9.48	13.63	13.28	16.48	16.33	
Norfolk	.20	7.25			7.65		7.45	7.95	7.65	9.50					
Philadelphia	.10	7.14	8.42	9.35	7.67		7.37	7.74	7.64	8.46	13.36	13.16	16.36	16.21	
Pittsburgh	.25	6.80	8.09	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05	15.90	
Portland		7.80	8.80	10.45	8.00		7.75	7.85	7.95	12.20		15.00		17.50	
Salt Lake City	.20		10.60		9.35			9.20	9.15						
San Francisco	.10	8.10	9.65	10.15	8.35		8.05	8.25	8.05	11.28*		14.25		17.85	
Seattle	.00	8.55	10.40	10.80	8.65		8.20	8.30	8.35	11.70		14.60		17.65	
St. Louis	.25	7.00	8.93	9.19	7.35		7.28	7.68	7.37	8.14	13.69	13.14	16.35	16.19	
St. Paul	.25	7.46	8.50	9.16	7.72		7.65	7.94	7.74	8.51		13.51		16.38	

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity. Exceptions: (*) 1500 to 9999 lb. (*) 1000 lb or over. (*) \$2.25 delivery. (*) 1000 to 1999 lb. \$2.25 delivery.
* Plus analysis charge.

Miscellaneous Prices

(Effective Nov. 15, 1955)

TOOL STEEL

F.o.b. mill					
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.60
18	4	1	—	5	2.205
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	2	6	—	1.85
6	4	2	5	—	1.105
High-carbon chromium					
Oil hardened manganese					
Special carbon					
Extra carbon					
Regular carbon					
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.					

CLAD STEEL

Base prices, cents per lb. f.o.b.

Cladding	Plate (A3, J2, L4)			Sheet (J2)
	16 pct	15 pct	20 pct	20 pct
304	30.30	33.15	36.05	37.50
316	35.50	38.45	41.40	47.00
321	32.00	34.85	37.75	37.25
347	34.40	37.80	41.40	48.25
405	25.80	29.60	33.35	—
410, 430	25.30	29.10	32.85	—

CR Strip (89) Copper, 10 pct, 2 sides, \$8.00; 1 side, \$0.00.

LAKE SUPERIOR ORES

\$1.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

Furnace, beehive (f.o.b. oven)		Net-Ton
Connellsville, Pa.		\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)		
Connellsville, Pa.		\$16.00 to \$16.50
Foundry, oven coke		
Buffalo, del'd		\$28.08
Chicago, f.o.b.		25.75
Detroit, f.o.b.		26.25
New England, del'd		26.05
Seaboard, N. J., f.o.b.		25.50
Philadelphia, f.o.b.		25.00
Sweden, Pa., f.o.b.		25.00
Plainville, Ohio, f.o.b.		25.50
Erie, Pa., f.o.b.		25.00
Cleveland, del'd		27.43
Cincinnati, del'd		26.56
St. Paul, f.o.b.		23.75
St. Louis, f.o.b.		26.00
Birmingham, f.o.b.		24.40
Lone Star, Tex., f.o.b.		19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	16.05
14	72	22.00	24	72 to 84	16.30
12	72	23.50	20	90	16.10
10	60	24.25	17	72	16.35
7	60	24.50	14	72	16.85
6	60	27.25	12	60	11.75
4	40	30.25	10	60	11.60
3	40	32.00	8	60	12.10
2 1/2	30	33.75	—	—	—
2	24	52.50	—	—	—

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Machine and Carriage Bolt

	Discounts	
	Full case	Full case 20,000 lb. or more
1/2 in. & smaller x 6 in. & shorter	61	63
Larger than 1/2 in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts 1/2 in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex., H.P., reg. & hvy.

1/2" or smaller	64	66
3/4" to 1 1/4" inclusive	62	65
1 1/2" to 1 3/4" inclusive	65	67
1 1/2" and larger	61	63

C.P. Hex. regular & hvy.

3/4" or smaller	64	66
3/4" and larger	61	63

Hot Galv. Nuts (all types)

1 1/2" or smaller	44	47
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Finished, Semi-finished, Hex. Nuts

1/2" and smaller	66	66
3/4" and larger	63	63
Add 25% for less than case or keg quantity.		

Rivets

	Base per 100 lb	
1/2 in. and larger	\$9.55	Per Off List
7/16 in. and smaller	32	

Cap Screws

	Discount	
	Bright Treated	H.C. Heat
New std. hex head, pack-aged		
1/4" thru 3/4" diam. x 6" and shorter	34	20
9/16" and 5/8" x 6" and smaller and shorter	31	16
3/4" thru 1" x 6" and shorter	8	+11
New std. hex head, bulk		
1/4" thru 3/4" diam. x 6" and shorter	49	41
9/16" and 5/8" diam. x 6" and shorter	48	39
3/4" thru 1" x 6" and shorter	31	20
* Minimum quantity per item:		
15,000 pieces 1/4", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 3/4", 1" diam.		

Machine Screws & Stove Bolts

	Discount	
	Mach. Screws	Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
1/4 in. diam. & under	Quantity	
5/16 in. diam. & larger	25,000-200,000	20 61
All diam. over 3 in. long	15,000-100,000	20 61
	5,000-100,000	— 61

Machine Screw & Stove Bolt Nuts

	Discount	
	Hex	Square
Packaged, package list	24	27
Bulk, bulk list		
1/4 in. diam. & smaller	Quantity	
	25,000-200,000	18 20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	122.9
San Francisco-L. A.	131.1
Oct. 1955 value, Class B or heavier 6 in. or larger, belt and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.	

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa., (except Salina, Pa., add \$5.00)	\$122.00
No. 1 Ohio	138.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$128.00
Childs, Hays, Pa.	132.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty	
Hays, Pa., Athens, Tex., Wind-ham, Warren, O.	145.00
Curtner, Calif.	162.00
Silica cement, net ton, bulk, East-ern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chi-cago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	32.00

Chrome Brick

Standard chemically bonded, Balt.	\$91.00
Standards chemically bonded, Cur-tner, Calif.	101.25
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	\$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite

Domestic, f.o.b. Baltimore	St. %-in. grains
in bulk fines removed	\$64.00
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	
in bulk	40.00
in sacks	46.00

Dead Burned Dolomite

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	\$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.i.f.	
New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge, iron, 98+%	
Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+%	27.5¢
domestic 99.5+%	38.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+%	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+%	\$3.0¢ to \$1.48
Aluminum freight allowed	\$4.50¢
Brass, 10 ton lots	\$7.50¢ to \$0.00¢
Copper, electrolytic	53.75¢
Copper, reduced	53.75¢
Cadmium, 100-199 lb. 96¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	\$3.60
Lead	7.50¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	\$3.00 to \$3.25
Nickel, unannealed	\$1.60
Nickel, annealed	\$1.66
Nickel, spherical, unannealed, #80	\$1.15
Silicon	43.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	\$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢



RITCO

**Bright Finish
DROP
FORGINGS**

in steel or non-ferrous metals,
from 1/4 lb. to 15 lbs.

Drop Forgings mean stronger, lighter parts: **Bright Finish** means less machining, more accurate dimensions: **RITCO** means absolute reliability.

Our complete finishing facilities are available for machining and grinding. Send blueprints for free estimates.

RITCO also makes special fasteners and finished bolts with regular or heavy heads. We are the exclusive New England representative for Cleveland Cap Screw Company.



RHODE ISLAND TOOL CO.
Since 1834

148 WEST RIVER STREET • PROVIDENCE 1, R. I.

November 17, 1955



**PICKLING TANK TEST
in 3 minutes with
FERRO PICKLE PILLS**



As easy as 1...2...3. Any workman who can tell red from green and count to ten can test the exact strength of pickling solutions... the exact percentage of iron. That's why Ferro Pickle Pills have been standard equipment in the best pickling rooms for years. They're efficient, economical and easy to use.



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Write today for literature and prices!



FERRO CORPORATION
Supplies Division

4150 EAST 56th STREET • CLEVELAND 5, OHIO

Ferroalloy Prices

(Effective Nov. 15, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, 30-100% max. Si.

0.02% C ... 38.50	0.20% C ... 35.50
0.06% C ... 36.50	0.50% C ... 35.25
0.10% C ... 35.00	1.00% C ... 34.00
0.15% C ... 35.75	2.00% C ... 33.75
4.00-4.50 C, 67.70% Cr, 1-2% Si ... 26.35	
5.50-6.00% C, 67-64% Cr, 2.00-4.00% Si ... 25.00	

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-66% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads ... 28.65
Ton lots ... 30.65
Less ton lots ... 32.05

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 3¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C ... 11.27
0.50% max. C ... 1.27
0 to 11% C, 88-91% Cr, 0.75% Fe ... 1.34

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.)

Contract price, carloads, delivered, lump, 2-in. x down, per lb of Cr, packed.

Carloads ... 41.85
Ton lots ... 46.15
Less ton lots ... 48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

80-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads ... 22.95
Ton lots ... 25.25
Less ton lots ... 26.75

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-30% Ca, 14-15% Mn, 52-59% Si.

Carloads ... 23.05
Ton lots ... 24.95
Less ton lots ... 25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 6-7% Mn, 5-7% Zr, 20% Fe 1/4 in. x 12 mesh.

Ton lots ... 19.65
Less ton lots ... 20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 88-92% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots ... 16.60
Ton lots ... 18.10
Less ton lots ... 19.35

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed ... 17.50
Ton lots to carload packed ... 13.25
Less ton lots ... 19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Cents per lb

Producing Point

Marietta, Ashland, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. ... 9.50
Clairton, Pa. ... 9.50
Sheridan, Pa. ... 9.50
Philo, Ohio ... 9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk ... 12.10
Ton lots packed ... 14.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	Price
16 to 19%	3% max.	\$86.00
19 to 21%	3% max.	\$8.00
21 to 23%	3% max.	\$9.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed ... 45.00
Ton lots ... 43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads ... 30.00
Ton lots ... 32.00
250 to 1999 lb ... 24.00
Premium for hydrogen-removed metal ... 0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.35 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 21.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn ... 32.00	33.85	35.05
0.07% max. C ... 29.95	31.80	32.80
0.15% max. C ... 28.45	30.30	31.50
0.30% max. C ... 26.95	28.80	30.00
0.50% max. C ... 26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ... 23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ for shipping point.

Carload bulk ... 11.20
Ton lots ... 12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet ... 12.70
Ton lots, packed ... 14.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$90.00 gross ton, freight allowed to normal trade area.

Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$87.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
95.50% Si, 2% Fe ... 22.75	21.45	
98% Si, 1% Fe ... 23.25	21.95	

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk ... 6.75
Ton lots, packed ... 9.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

50% Si ... 11.75	75% Si ... 15.40
65% Si ... 14.50	85% Si ... 17.10
90% Si ... 18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots ... \$2.05	\$2.95	\$3.75	
Less ton lots ... 2.40	3.30	4.55	

Ferrovandium

50-55% V contract basis, delivered, per pound, contained V, carloads, packed.

Openhearth ... 3.10
Crucible ... 3.10
High speed steel (Primor) ... 3.30

Alisifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ... 10.35
Ton lots ... 11.50

Calcium molybdate, 46.3-46.5% f.o.b. Langloeth, Pa., per pound contained Mo ... 1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots ... 36.90
Less ton lots ... 6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta ... 14.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo ... 1.46

Ferrophosphorus, electric, 23-25%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00

10 tons to less carload ... \$110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... 11.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... 11.50

Less ton lots ... 11.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... \$177.00

Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, f.o.b. ... 33.45

Molybde oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa. ... 11.27

bags, f.o.b. Washington, Pa., Langloeth, Pa. ... 11.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump ... 15.50

Ton lots, packed lump ... 16.75

Less ton lots ... 11.55

Vanadium oxide, 86-89% V₂O₅, contract basis, per pound contained V₂O₅ ... 11.33

Zirconium contract basis, per lb of alloy

25-40%, f.o.b. freight allowed, carloads, packed ... 26.25
12-15%, del'd, lump, bulk-carloads ... 8.50

Boron Agents

Borasil, contact prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained B ... 55.35

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ... 45
Less ton lots, per pound ... 50

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed

Ton lots per pound ... 10.00

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.30

F.o.b. Wash., Pa.; 100 lb up

19 to 14% B ... .85
14 to 19% B ... 1.20
19% min. B ... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ... 81.00
No. 79 ... 50

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 1.00% max. C, 2 in. x D, del'd.

Ton lots ... 11.45
Less ton lots ... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... 12.95

Stienz, contract basis, delivered.

Ton lots ... 45.00



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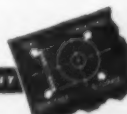


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City.....State.....

Signature.....

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or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Detroit Optimistic . . . Used machinery business in the Detroit area is continuing at a good rate and dealers expect it to continue through the balance of 1955.

There are several reasons for the optimism but two are advanced more often than others. Dealers expect the current expansion programs in the auto industry to increase the need for machinery.

They also expect that tool and die companies in the area will soon get started on programs for the 1957 model cars. Predictions are that a major change will be coming up that year and that the need for different types of machines will increase accordingly.

Hold More Auctions . . . Meanwhile, the number of machinery auctions has increased during the last three months. Dealers see no particular significance in this except for the fact that some parent companies are consolidating operations and auctioning machines that are no longer needed.

Several types of machines are in demand at the present time. Late model tool room equipment, which is always a good seller, is leading the parade. One dealer reports a case where a machine tool builder wanted to buy one of his own used table-type jig borers. The demand is also high for boring mills.

Press Demand Heavy . . . Presses are the number two item in Detroit and are becoming scarce. A tool and die maker in the area has been looking for a certain type of die tryout press for the last six months without success.

Inquiries to other parts of the country have failed to turn up the piece of equipment desired. Dealers also report that in addition to sending out inquiries for presses, they have also received letters asking about presses and take this

as an indication of how big the demand is.

Older types of machinery are still not moving the way dealers think they should. There is an occasional call for an older type of milling machine but other than that there is no demand. Scraping of obsolete items is continuing at a regular rate.

Business Volume Up . . . Dealers say that the volume of business for the first nine months of this year is up appreciably over 1954. But they are quick to add that profit margins have declined. Biggest cause of the smaller profits is the increase in competition for used machinery sales.

Also, new machinery sales have increased particularly since the Chicago show. Dealers believe that manufacturers who might have bought a used machine are spending their money for more modern equipment.

Most dealers believe that business for the first part of 1956 will be "fair."

Predictions are based on a continuing demand for new cars coupled with the start of production in this country of the German Volkswagen. Some parts for the German car are going to be made in Detroit and this is expected to keep the demand for good used equipment at a fairly high level.

Eastern Market Firm . . . Philadelphia dealers generally aren't unhappy on 4th quarter sales to date. In fact, while reporting "fair"—in some cases "good"—movement in such items as heavy and light presses, spot welding, and small sheet metal equipment, they're enthusiastic about even better activity most of next year. Right now, they cite heavier-ton open back inclinables in tight supply. An appreciable pickup in demand for die tryout presses is noted.

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL

No. 3 Niagara Angle Bending Roll

MALE

#125P-65 Legemann, Charging Bar 60x12x34. Pro-
duce Size 125 to 150 lbs.
#125-TC Galland Hemming, Volume of Box 145 cu.
ft. Size 500 to 600 lbs.

BENDING ROLLS

8' x 16" Bortch Initial Type

12' x 1/2" Niles Pyramid Type

16' x 1/2" Bortch Initial Type Bending Roll

18' x 1/2" Wickes Pyramid Type

30' x 1/2" Hillier & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE

8' x 1/2" Drets & Krump Blue 185

12' x 1/2" Drets & Krump, Motor Driven

BRAKES—PRESS TYPE

12' All Steel Press Brake, 250 ton Capacity

BROACH

Model VP-4-10-40 American Vertical Hydr. Broach.

Max. Capacity 60 ton, Stroke 40", Motor Drive

BULLDOZER

#9 W&W Mechanical Bulldozer, 38" Stroke, Face of

Crosshead 54"x20"x18" 50 H.P. A.C. Motor

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H 25' Span 220 Volt D.C.

5 ton Northern 50' Span 220 Volt D.C.

5 ton Northern 50' Span 220/3/60 A.C.

5 ton Cleveland 60' Span 220 Volt D.C.

7 1/2 ton P&H 60' Span 440/3/60 A.C.

10 ton Niles 60' Span 220 Volt D.C.

10 ton P&H 60' Span 220 Volt D.C.

15 ton P&H 60' Span 220 Volt D.C.

20 ton P&H 60' Span 220 Volt D.C.

20 ton Toledo 75' Span 500/3/60 A.C.

30 ton Shaw 60' Span 220 Volt D.C.

120 ton Whiting 80' Span 220/3/60 A.C.

With 10 ton Auxiliary

FORGING MACHINES

1' to 5' Acme, Ajax, National

1' to 4' 5" 7/8" National High Duty, Air Clutch

FURNACES

Lee Wilson Natural Gas Annealing Furnace, Work

Dimensions 45" x 60", 90" Piling Height

Westinghouse Bell Type Furnace, Gas Fired, Charge

Space 26" dia. x 42" deep

Ther-Monic Induction Heater Model 1409

15 ton Herault Top Charge, With Transformer

HAMMERS—BOARD DROP—STEAM DROP

STEAM FORGING—800 lb. to 20,000 lb.

JIG BORER

250 Knight Jig Borer, Complete—New 1950

LEVELERS—ROLLER

52" McKay 17 Rolls 3/4" Dia.

72" McKay Backed-Up Leveler, 15 Rolls 1/4" Dia.

72" McKay 15 Rolls 1/4" Dia.

76" Year-Unger, 22 Rolls 2.165" Dia.

PRESSES—HYDRAULIC

1257 ton Baldwin Northway Forging Press, 80"

Stroke Main Ram, 54" x 61" Bet. Columns

2845 ton Birdboro, 4 Columns, 14" Stroke Platen

42" x 40", Daylight 47"

4500 ton B-L-H Hydr. Forging Press

PRESS—TRANSFER

Baird 12 Station Model 4-37 Automatic Multiple

Transfer Press, 50 ton Capacity

PUNCH & SHEAR COMBINATIONS

BLUEFG 33 Pals Universal Ironworker, Capacity

Punch 1 1/2" thru 5", Shear Angles 60x1/2"

21 1/2" Buffalo Universal Ironworker

Style EF Cleveland 36" Throat, Punch 1 1/2" thru 1"

Style W Cleveland Single End, 60" Throat, 312 Ton

ROLL—PLATE STRAIGHTENING

84" Hillier & Jones, Six Rolls 10" Dia., M.D.

ROLLING MILLS

12' x 20" Garrison & W-F Two Stand Two High

12' x 20" Garrison Single Stand Two High

12' x 24" Garrison Single Stand Two High

18' x 24" Farrel P&M Two Stand Two High

30' x 26" Hoagland Single Stand Two High

24' x 44" Garrison Two High Hot Mill

ROLLS—FORMING

10 Stand Thicken MLW-1 1/2", Spindle 1 1/2" Dia.

3 Stand Rebar Tube Forming Machine, Spindle 1 1/2"

SHEARS—GATE

80" x 5 1/2" Pole

SHEARS—ANGLE

60x1" Lenz & Allstatter Size B

SHEAR—BAR

24 H&J Guillotine, Capacity 3 1/2" Square, 4" Round

SHEARS—ROTARY

3 1/2" Quickwork Rotary Shear, 20" Throat

1/2" Kling 250, With Flanging Attachment

1/2" Quickwork Whiting 204A—NEW 1953

1/2" Kling 2750, 48" Throat, Circle Cutting Attach.

1/2" Kling No. 150, 48" Throat, Jogging Rolls Incl.

SHEARS—SQUARING

16' x 12 Ga. Niagara No. 501B

10' x 1 1/2" Niagara Model L-10-1/2

SLITTERS

36" Vader Slitting Line with Coilers

36" Paxson Coil & Sheet Slitter

36" Custom Built Slitting Line, with Coilers & Leveler

STRAIGHTENERS

Taylor Wilson Cross Roll, Cap. 1/2" to 1 1/2" Bars

No. 3 Medart 3-Roll Rotary Straightener Capacity

1" to 3 1/2" bars or up to 4 1/2" tubes

1/2" Halden 23, With 20 ft. Cut-Off

TESTING MACHINE

5,000, 10,000, 200,000, 200,000# Olsen & Riels Un-

iversal; 50,000 & 300,000# Compression

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REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

Constant Duty, 3-phase, 60 cycle

Constant Duty, 3-phase, 60 cycle					
Qu.	H.P.	Make	Type	Volts	R.P.M.
1	2500	G.E.	MT	2200	240
1	2000	G.E.	MT	6600	690
1	1500	Whas.	CW	6600	593
1	1250	G.E.	MT	2200	357
1	750	G.E.	1-M	2200	460
1	500	Whas.	CW	2200	444
1	500	G.E.	MT	6600	600
1	500	Al. Ch.	ANY	2200	514
1	500	G.E.	1-M	2200	436
1	400	G.E.	1-M	2200	990
1	400	Al. Ch.	ANY	2200	514
1	400	G.E.	MT	2200	260
1	350	Al. Ch.	ANY	2200	440
1	250	Al. Ch.	ARY	440	730
1	250	G.E.	MT	2200	360

We can supply complete control with any of these.

SQUIRREL CAGE MOTORS

3 Phase, 60 cycle

3 Phase, 60 cycle					
Qu.	H.P.	Make	Type	Volts	R.P.M.
1	400	G.E.	IK	2200	514
1	200	Whas.	CR-873	2200	1160
1	200	Al. Ch.	AR	440/220	600
1	150	Whas.	CR	440/220	600
1	125	Al. Ch.	AR	2200	495
1	100	Al. Ch.	AR	2200	695
1	100	Al. Ch.	AR	2200	495

SYNCHRONOUS MOTORS

3-Phase, 60-Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
2	2100	G.E.	unity	2200	358
2	2000	G.E.	80%	2200	730
1	750	G.E.	80%	2200	450
1	710	G.E.	80%	2200	730
2	700	G.E.	80%	2200	1200
2	600	G.E.	unity	2200	327
1	250	G.E.	80%	2200	514
1	250	G.E.	80%	440	450
2	200	Whas.	80%	440	1200
1	150	G.E.	80%	440	450
1	150	G.E.	80%	2200	900
1	150	Whas.	80%	440/220	450
2	125	G.E.	80%	4000/2200	900
2	125	Elec. Mch.	80%	4000/2200	900
2	100	Whas.	80%	440/220	1800
2	100	G.E.	80%	440/220	600
1	100	Elec. Mch.	unity	440/220	260

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D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2000	Whas.	Tandem	550	600
1	2200	G.E.	MCP	400	400/500
1	1500	Whas.	Bar	400	600
1	1400	G.E.	MCP	400	68/190
1	1300	G.E.	MCP	400	750/850
1	1000	G.E.	MCP	400	850/700
1	800	Whas.	QM	250	350/750
1	600	Al. Ch.	ANY	250	480/400
1	500	Whas.	OC-316	400	300/900
1	400	G.E.	MCP	550	380/600
9	450	Whas.	ANY	550	415
1	350	Whas.	MPO	250	340/900
1	250	G.E.	1870T	250	400/400
1	200	Rel.	CD-1600E	250	500/1500
1	200	Whas.	CB-5119	250	400/800
1	150	G. Wh.	45H	800	350/750
1	150	Cr. Wh.	82H-TWFO	230	890
1	150	Whas.	RE-151H	230	900/1800
1	150	Whas.	RE-201	230	800/950
1	120	G.E.	MCP	230	250/1000
1	125	Whas.	RE-101	230	500/1500
1	125	Whas.	RE-103	230	850

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
3	3000/3000	G.E.	450	250/300	2200/4000
1	1750/1100	G.E.	514	250/300	2200/4600
1	2000	G.E.	180	250	220/1100
1	1500	G.E.	514	600	800/1350
1	1500	G.E.	720	600	800/1350
1	1500	C.W.	514	80/115	800/1300
1	1000	G.E.	720	600	2300/4000
2	750	G.E.	720	975	2300/4600
1	750	C.W.	514	80/115	2200
1	750	Whas.	900	250	2200/4000
1	600	G.E.	720	250	440/2200
1	500	Whas.	900	250	2200/4000
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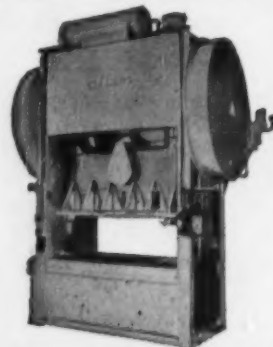
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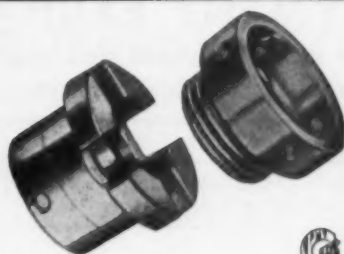
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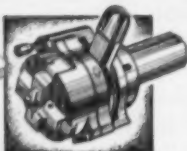
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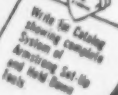
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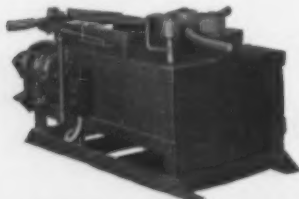
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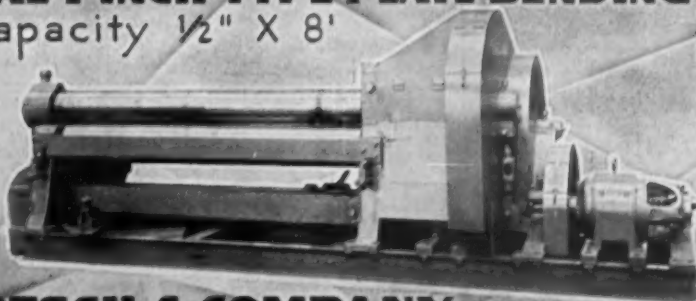
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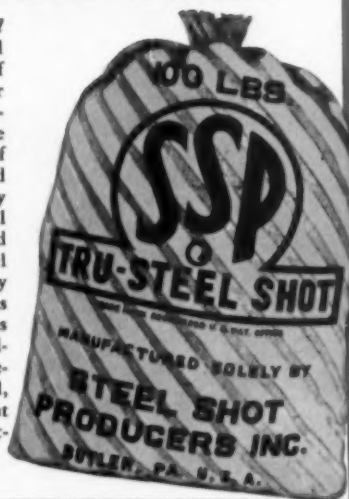
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